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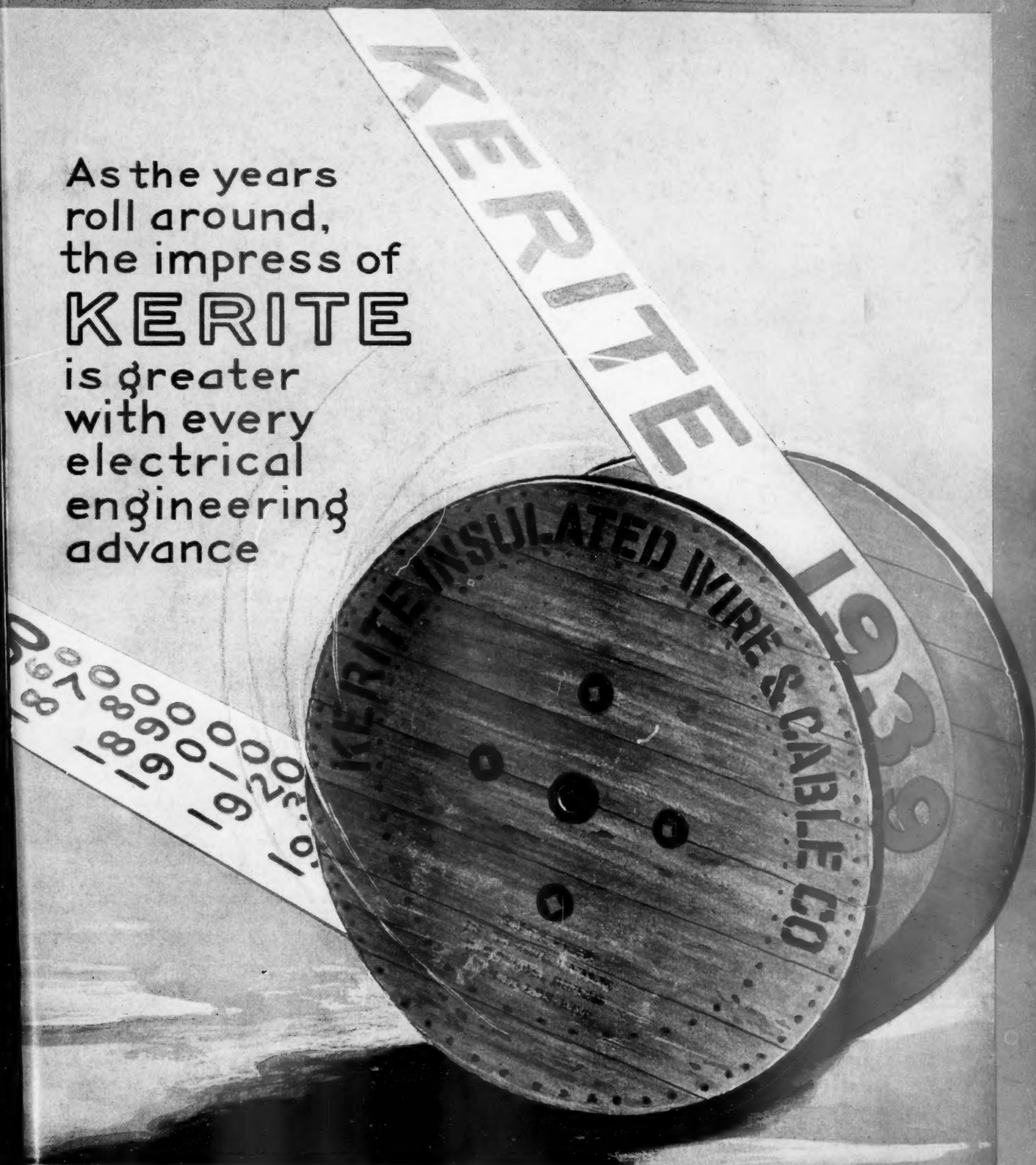
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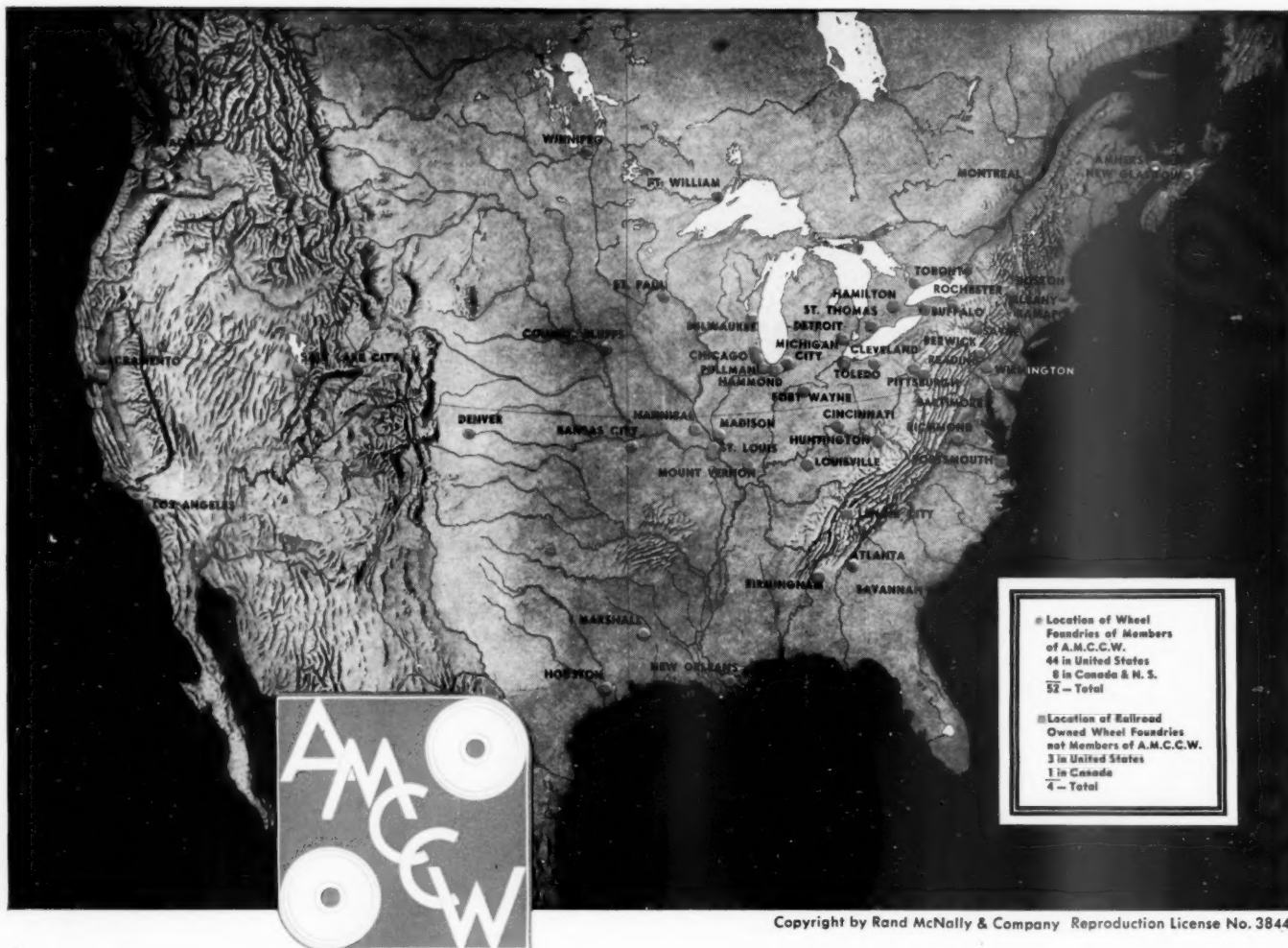
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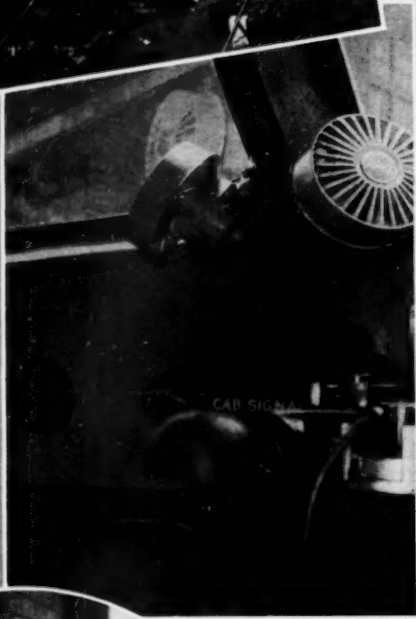
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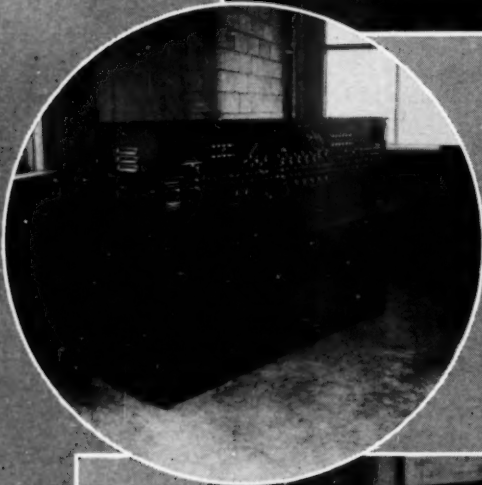
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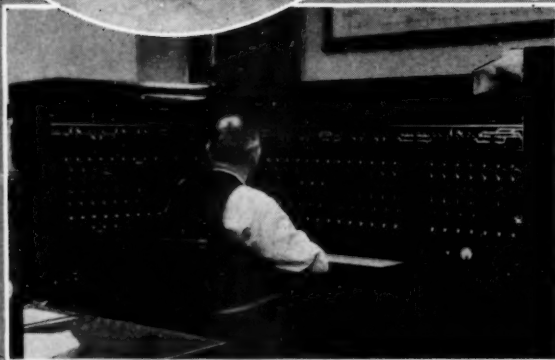
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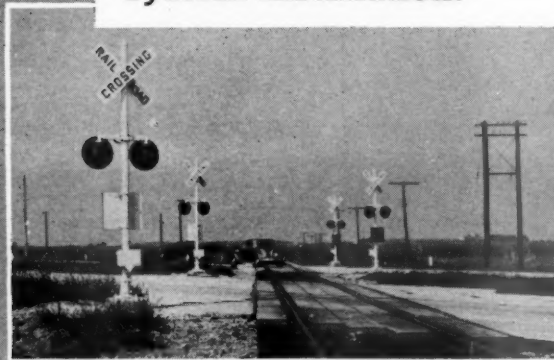
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RAILWAY AGE

The Significant Railway Results of 1938

The results of railway operation in 1938 demonstrate more conclusively than those of any previous year the existence, the seriousness and the difficulty of the railroad problem in the United States. They show more clearly than those of any previous year what may make that problem insoluble under private ownership. And they also show more clearly than the results of any previous year what can and must be done to solve the problem under private ownership.

The railroad problem is essentially a financial one—i.e., one of net operating income. Let net operating income—the earnings left after paying operating expenses and taxes—stay too low too long and private ownership will not merely die: it will be dead. Only by increasing net operating income and keeping it at a reasonable level can private ownership be preserved.

Net operating income was earned in the first half of 1938 at an annual rate of only 0.67 per cent. This was a much lower rate than is required to keep private ownership alive. At that rate it would have amounted for the entire year to only \$174,000,000. "Other income" would have made "total income" available for paying fixed charges only about one-half of fixed charges—in other words, the industry would have incurred a deficit of about \$300,000,000. On that basis most of the large railway systems still solvent would soon have become insolvent; and the nation would have found itself with an almost completely bankrupt railroad system on its hands.

An Unprecedented Change in Financial Results

But, although observed by few persons for some time, a change for the better began in May. In that month freight loadings declined to the lowest point to which they were reduced by the recession, and began slowly to rise. They continued to increase steadily throughout the rest of 1938 until—allowing for seasonal variations—they were in December 24 per cent better than in May. The result was the most spectacular difference between railway financial results in the first and the second halves of a year ever reported. The railways earned \$365,000,000 net operating income in the entire year 1938. They normally earn about 40

per cent of their net operating income in the first half of a year and 60 per cent in the second half and apparently never before earned more than 68 per cent in the second half. But in 1938 they earned only \$70,000,000, or 19 per cent of it, in the first half of the year, and they earned \$295,000,000, or 81 per cent of it, in the second half. It was very much the smallest in the first half of 1938 that it has been in the first half of any of the depression years. It was larger in the second half than in the second half of 1931, 1932, 1934, or 1937.

In spite of the large increase in the second half of the year, however, it was the smallest amount earned in any entire year of the depression excepting 1932, being about \$30,000,000 larger than in 1932, but about \$110,000,000 smaller than in 1933.

The Attitudes of Commission, Labor and the President

In the early part of the year the railways sought from the Interstate Commerce Commission a 15 per cent advance in freight rates, but were granted only about 5 per cent. They then sought a 15 per cent reduction of wages, but secured none at all. The financial results of operation in the first half of the year demonstrate beyond any question that without the substantial increase in their traffic that occurred the railroads could not have stood the wages in effect throughout the year and the freight rates that the Interstate Commerce Commission, by its decision late in March, authorized them to charge. The Commission cannot claim it took this increase of traffic into consideration when it rendered its rate decision, because traffic declined for two months afterward. Nor can President Roosevelt claim he took it into consideration when he made his first public declaration against a reduction of wages, because at that time traffic was still declining. In other words, what the record shows is that both the Commission and the President refused to do, or opposed doing, what was absolutely necessary under the conditions existing during the first half of 1938 to save the railway industry from financial destruction, and that it was saved in spite of them by an

increase of net operating income due entirely to an improvement in general business and traffic that they could not have foreseen.

Improvement Due Entirely to Increase of Traffic

It is extremely desirable that the increase in the volume of freight traffic in the second half of 1938 should be identified and emphasized as the real and only cause of the improvement in railway financial results. At the bottom of the "recession" in May freight loadings were only 53.2 per cent as large as they averaged in the prosperous years 1925-1929; and throughout the first half of 1938 they were smaller than in 1932, although there has been since then an increase of about 5 per cent in the country's population. In June they were 54.7 per cent of the 1925-1929 average; in July, 56.5 per cent; in August, 55.5 per cent; in September, 58.0 per cent; in October, 61.6 per cent; in November, 61.3 per cent, and in December, 66.4 per cent. In April net operating income was only \$9,200,000 and represented an annual rate of return of only 0.54 per cent. By October it had increased to \$68,600,000 and represented an annual rate of return of almost 2 per cent. In November it had increased to an annual rate of 2.32 per cent. Nothing else could emphasize so strongly as such facts that the paramount need of the railways is increase in the volume of their traffic unaccompanied by reductions of their rates or advances in their operating costs.

Unprecedented Curtailment of Maintenance and Employment

In spite of the improvement in its latter half the year 1938 has gone down as one of the worst, if not the worst, in railroad history. Gross earnings were larger than in 1932, 1933, 1934 or 1935; but, the increases in operating expenses over those years were greater; and taxes were larger than in any year since 1930. The managements got as much net operating income as they did only because they made more drastic restrictions of maintenance than in any of the previous depression years. The only depression year whose net operating income was less than that of 1938 was 1932. How much more maintenance was retrenched in 1938 than in 1932 is indicated by the facts that although the freight business handled was 8 per cent larger than in 1932, the number of men employed was 9.4 per cent, or 98,000, less. At the average wage paid last year, this reduction in the number of employees curtailed the payroll \$181,000,000—an amount almost one-half as great as the net operating income earned in 1938, and more than one-half as great as the net operating income earned in 1932. As the reduction was principally in maintenance employees it is apparent that the net operating income secured last year would have been much smaller than in any previous depression year excepting for the fact that the amount of maintenance

work done was smaller than in any previous depression year. The facts do not indicate efficiency or economy. They simply indicate that, in order to pay the highest wages in history under almost the worst business conditions in history, and avoid bankruptcy, many railways allowed their properties to deteriorate more than in any previous year.

Purchases Lowest Excepting in 1932 and 1933

Purchases of materials used principally in maintenance seem to tell a somewhat different story. They amounted to \$340,000,000, the smallest in any year of the depression excepting 1932 and 1933, but about 27 per cent larger than in those years. However, this increase in purchases over 1932 and 1933 is principally accounted for by an advance of about 20 per cent in prices, leaving the amount of materials actually bought hardly any larger than in 1932 or 1933.

Orders for equipment amounted to about \$54,000,000, making total purchases from the manufacturing industry about \$394,000,000. These total purchases also were the smallest made from the manufacturing industry in any year of the depression excepting 1932 and 1933, although remaining, partly owing to higher prices, about 45 per cent higher than in 1932 or 1933.

Orders for locomotives declined from 533 in 1936 and 368 in 1937 to 228 in 1938. The orders in 1938, however, exceeded the number placed in any year between 1930 and 1936. Orders for freight cars declined from 67,544 in 1936 and 52,738 in 1937 to 16,539 in 1938, and were the smallest in any year of the depression excepting 1931, 1932 and 1933. Orders for passenger cars declined from 829 in 1937 to 269 in 1938. In the seven years ending with 1930 the number of locomotives ordered averaged 965 annually, the number of freight cars 83,480 and the number of passenger cars, 1,875, while in the seven years ending with 1937 the averages were, locomotives, 201; freight cars, 25,450; and passenger cars, 239.

While other facilities of the railways were declining or deteriorating in 1938, their mileage of line was making the greatest decline in history excepting in one year. Total new mileage built was 38—the smallest of record excepting in 1933. Mileage abandoned was 1,897—the largest of record excepting in 1934. The net result was a decline in the country's total railway mileage of 1,859 miles. This was the eighth year in history, and the seventh consecutive year, in which abandonments exceeded 1,000 miles. Abandonments during the last seven years have been as follows: 1932, 1,452 miles; 1933, 1,876 miles; 1934, 1,995 miles; 1935, 1,843 miles; 1936, 1,523 miles; 1937, 1,140 miles; 1938, 1,897 miles; total, 11,725 miles. The largest mileage abandoned in any state last year—215 miles—was in Nevada. New York was second with a total abandonment of 201 miles.

The increase of traffic, and the consequent phenomenal increase of net operating income, in the second

half of 1938 have made prospects of the railway industry and the railway manufacturing industry much better than they were a year ago. In November, the latest month for which statistics are available, and relatively the best month of 1938, net operating income was earned at an annual rate of 2.32 per cent. If the railways should earn at only this rate throughout 1939 their net operating income for the year would be about \$600,000,000, or 65 per cent larger than in 1938, and larger than in any year since 1930 excepting 1936. But as their traffic and net operating income have now increased more than seasonally for eight months they undoubtedly will continue to do so during most, if not all, of 1939. If this should be the case, their net in 1939 might approach 1936's \$667,000,000.

Greatly Improved Prospects for 1939

An increase of net operating income to this level probably would rapidly cause an increase in buying of equipment and materials from the \$394,000,000 level to which it declined in 1938 to an annual level of at least \$750,000,000. Such purchases averaged more than \$800,000,000 in 1936 and 1937.

To say that the immediate prospects of the railways and the railway manufacturing industry are greatly improved is not, however, to say that they are good, because the prospective net operating income and, therefore, the prospective railway buying of 1939 are only about one-half as large as the actual net operating income and buying of 1929, a decade ago. Furthermore, as was indicated in the early part of this editorial, experience in 1938 gives a very solemn warning to those able to understand it regarding the dangers of the present railway situation. In the first half of 1938, with a freight traffic about one per cent smaller than in 1932 and $7\frac{1}{2}$ per cent larger than in 1933, the railways, in spite of the most drastic retrenchments in their entire history, earned 37 per cent less net operating income than in the first half of 1932 and 54 per cent less than in the first half of 1933—the two worst previous years of the depression—and incurred a deficit after charges of \$181,000,000, or \$1,000,000 a day.

The Warning of 1938

These facts show that, on the basis of the traffic, rates, wages, prices and taxes of the first half of 1938, the railway industry of the United States as a private enterprise was doomed to early financial destruction, and that the people of the country were confronted with the early necessity of adopting government ownership to keep the railways in operation.

Who knew that traffic would not remain on that basis? Who knows how long it will be before it again declines to that basis? Nobody. But during that first half of 1938 hardly a finger was lifted by any person, agency or interest to help railway management pilot private ownership through the most critical and threat-

ening crisis in its entire history. The Interstate Commerce Commission granted only a 5 per cent advance in rates when 15 per cent was sought. Members of Congress, for their own political purposes, scuttled proposed legislation for railway relief because railway management decided to seek a 15 per cent reduction of wages. The unions of railway employees refused to agree to any reduction whatever of the highest wages in history. The President of the United States publicly announced his opposition to any reduction of wages when the smallest net earnings in modern history were being made and traffic was still declining. No business or farm organization made any statement in behalf of the railways indicating that its members had the slightest realization of how serious the railway crisis was or any interest in it.

The Vital Need of the Railways

Suppose that business and traffic had remained as bad for a year more as they were in the first half of 1938. There would have been a lot more talk than there is now about railway legislation during the next session of Congress, but probably all the talk would have done no good, because probably all the legislation that could have been passed would have been too late. There would have either been recognition by this time of the necessity of both reductions of wages and larger advances of rates, or of the fact that private ownership was done for.

The effects of the lack of traffic in the first half of 1938 and of the increase of traffic in the second half on railway financial results equally emphasize that the one great and vital essential to a solution of the railroad problem under private ownership, if present wages, prices and taxes are to be maintained, is a very large increase in the volume of railway traffic. How can that be secured? Only, first, by changes in government policies regarding transportation which will enable the railways to get a larger share of the total traffic available; and, second, by changes in the policies of government, business and labor which will increase the total traffic available for all carriers.

Nobody knows of how much freight traffic the railways have been deprived by their competitors, but an estimate by the Bureau of Railway Economics, which is the most reliable available, regarding the division of the traffic in 1926 and 1937, throws light on the question. According to this estimate total ton-miles of freight traffic in 1926 were 594,000,000,000, of which 75.4 per cent were railroad traffic. In 1937 total ton-miles were 554,000,000,000, of which only 65.5 per cent were railroad traffic. Railroad freight revenues in 1937 were about \$1,400,000,000 less than in 1926. If the railroads had got 75.4 per cent of the total freight traffic in 1937, and received for carrying it the same revenue per ton-mile as in 1926, their freight revenues in 1937 would have been only about \$325,000,000 less than in 1926. That about \$527,000,000 of the decline in their

freight earnings was due to loss of traffic to other carriers is indicated by the fact that the part of the total traffic carried by them declined from 75.4 per cent in 1926 to 65.5 per cent in 1937. The remaining decline of about \$550,000,000 in their freight earnings was due to the decline in their average revenue per ton per mile from 1.081 cents in 1926 to 0.935 in 1937; and it is agreed by most traffic experts that this decline in their average rate was almost entirely due to efforts made by them to avoid losing more traffic to other carriers. Thus it would appear that by (1) taking traffic from the railways and (2) forcing them to reduce their rates the competition of other carriers cost the railways about a billion dollars in freight revenues in 1937 and a proportionate amount in 1938.

Effects of Unfair Competition

If this competition were unaided by government and, therefore, fair, there could be no justifiable criticism of it—but most of it is aided by government and, consequently, unfair. Obviously, therefore, the first step that should be taken to cause the increase in traffic which the experience of 1938 has shown that, with present rates, wages and taxes, the railways must have, is the adoption of federal and state legislation to equalize the regulation and subsidization of the railways and their competitors. How much the freight earnings of the railways would be increased by equalization of government treatment of them and their competitors is, of course, conjectural, but it seems conservative to estimate that, on the basis of present business conditions, the increase would be a half billion dollars annually.

In recognition of the importance and seriousness of the long-range railroad problem, it has been subjected to study by representatives of more groups of the people within the last year than at any time since 1919, if not, indeed, during any previous year in history.

A notable declaration which does not refer to the railroad problem, but which advocates principles the application of which would solve it, is that entitled, "Industry's Program for American Progress," which was adopted by the National Association of Manufacturers on December 8. This program says: "Regulation, for the public good, of certain aspects of private enterprise is recognized by all as an essential function of government. Government *should not*, however, *either operate or directly control the facilities of private business* engaged in production or *exchange* of goods and *services*. . . . Government should not attempt by compulsion or *inducement* to control the kind or quantity of goods and *services* to be produced and distributed to the people, beyond measures required to insure *fair*, free and open competition and to protect the public health." It is to be wished that all manufacturers and other business men would recognize the fact that these two sentences constitute a condemnation and indictment of the entire present unequal govern-

mental policy of regulation and subsidization of transportation agencies and would act accordingly.

Important Studies of Railroad Problem

Another notable document is the report of the "Committee-of-Six"—three railway presidents and three railway labor leaders—concerning the transportation problem which was made to President Roosevelt on December 23. This is the most adequate and conclusive statement of the causes and solution of the country's transportation problem, excepting in one particular, that has ever been prepared. The exception is that it makes virtually no reference to the high labor costs due to high wages and expensive working rules which are among the most important factors in the problem. Never before have the causes and effects of existing competitive conditions in transportation been so completely stated and conclusively demonstrated.

Another group working on the railroad problem is the Transportation Conference sponsored by the Chamber of Commerce of the United States, consisting of representatives of various business groups. Indications are that its report will err as much by inadequately emphasizing the causes and effects of present transportation competitive conditions as does the report of the Committee-of-Six by inadequately emphasizing the existence, the causes and the effects of high railway labor costs.

Only Comprehensive Action Will Serve

The nation has had a railroad problem for many years. It caused the adoption of government operation in 1918 and the return of the railways to private operation in 1920. Passage of the Transportation Act of 1920 was the most constructive effort ever made to solve the problem. It has been greatly changed by the depression, the increase of competition by other carriers largely due to governmental aid, and the policies of the Roosevelt administration regarding prices, wages and taxes. There must be legislation even more comprehensive than the Transportation Act of 1920, and also much more unified and courageous action by railway managements, if the railroad problem of today is to be solved.

In view of the short-range trend, there is no hazard whatever in forecasting that 1939 will be a very much better year than was 1938 for the railways and the industries depending on their purchases for business. In view of the long-range trend in the affairs of the railways, however, nothing could be more hazardous at present than to forecast their future even for a few years. But one thing is certain—if private ownership is to be maintained—government, labor, business and railway management will have to do much more to prepare private ownership for passing through the next depression or "recession" than they did to prepare it for passing through the "recession" of 1937-1938.

What Will Earnings Be in 1939?

Carloadings approaching the 1936 level seem likely—
Such loadings should yield 600 millions or more N.R.O.I.

IN the *Railway Age* of December 3 we surveyed recent developments in railway traffic and earnings and, based upon them and the outlook for production by some of the nation's key industries, predicted that carloadings and net railway operating income for 1939 ought to come pretty close to those of 1936. (In 1936 freight cars loaded totaled 36 millions and net railway operating income was 667 million dollars.)

A lot of water has gone under the bridge since December 3, when we made that prediction—but nothing of a kind to induce us to reduce our estimate. As a matter of fact, if we were to revise our prediction at all, it would be slightly upward, rather than downward.

Political Factors Omitted

There are strings tied to this prediction, of course. Our estimates are of necessity compounded only of the factors in the railroad situation that we know about. We don't know anything about the possibilities of a war in Europe, either pro or con. We don't know a great deal, either, what thoughts may be going on in the minds of some politicians—which may bode either good or evil for the railroads. We will say this, though, about the present political outlook, namely, that there has been a great deal of discussion about plans to help the railroads and little or none that we know of, about schemes to harm them.

But we are leaving international affairs and domestic politics out of our calculations—and simply ask ourselves: Supposing nothing political is done either to help or harm the railroads, what then? What will they probably have in 1939 in the way of traffic? How much

money will they earn? And how much will they be able to spend to contribute employment and prosperity to other industries?

Our prognostication, as we stated above, is that the roads ought to do about the same business and make, perhaps, only a little less than the 667 millions of net railway operating income which they earned in 1936. Compared with 1938, such traffic and earnings would be a big improvement (20 per cent in traffic and more than 66 per cent in earnings). This, however, would be a good deal like giving a square meal to an unemployed man who hadn't eaten in a week. That is to say, the fellow would be better off than he had been—but his basic difficulties would not be settled by a long shot.

600 Millions Is Not Enough

Neither will the railroads be out of the dog-house if they should earn 600 millions in net railway operating income in 1939. Because 600 millions would represent a return of less than $2\frac{1}{2}$ per cent on the money invested in railway property. And you can't get new investment money to come into an industry freely, to keep its plant up-to-date, when the old money is earning less than $2\frac{1}{2}$ per cent. If the railroads don't start attracting investment money pretty soon, it is just going to be too bad for the industry and the people who work for it—because railway competitors (thanks to the generous taxpayers) are getting huge new investments each year. An out-of-date railroad system finds it pretty tough, competing with an up-to-date highway system or waterway system—just like a crystal set radio would find it hard to compete against a modern electric phonograph,

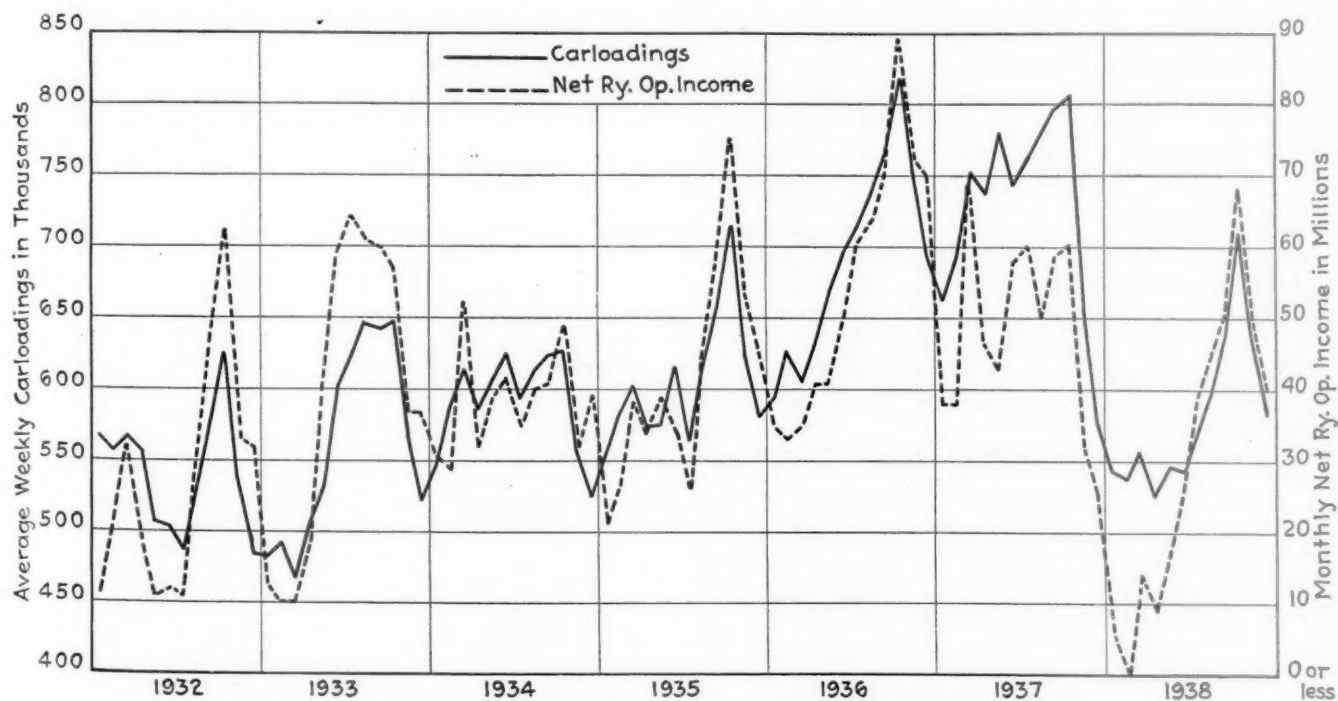


Chart I—Showing How Railroads Make Money In Proportion as Carloadings Increase

even where the customer would prefer a radio to a phonograph if one equally as modern were available.

Well, then, net railway operating income of 600 plus millions which we foresee, barring political upheavals, in 1939 isn't so much. But it is 239 million dollars, or 66 per cent, better than 1938, and that is something. Moreover, since the money the railroads spend with the manufacturing industry (as an empirical fact) usually exceeds slightly the sum they earn in net railway operating income, it follows that, in 1939, the railroads should spend more than 600 millions with manufacturers, which is 206 millions, or 52 per cent, more than they spent in 1938.

Good Fall Loadings Forecast a Good Year

Now as to how we arrive at our estimate—barring political intervention—of 36 million carloadings and better than 600 millions of net railway operating income in 1939: First we invite attention to Chart I herewith, which shows what a close parallel there is between freight carloadings and net railway operating income. It will be seen that in three years prior to 1938 (1933, 1935 and 1936), freight carloadings ended the year at a materially higher level than they were at the beginning of the year. Next, observe what happened to the curve in 1934, 1936 and 1937—particularly 1936 and 1937. It seems quite clear from the chart that carloadings running strong at the end of the year are a pretty good augury for good business in the following year.

For example, carloadings ran strong at the end of 1935, foretelling that 1936 would be a year of increasing traffic. Likewise at the end of 1936 loadings were running strong, foretelling rising traffic for 1937. The 1937 rise—later on in the year—turned sour, to be sure, but even at that 1937 piled up more carloadings than 1936; so the augury of strong loadings at the end of 1936 was still a true one.

Continuing to observe the chart, it will be seen that in one of the three years (1933) strong late-year loadings were not followed by such a very good year (1934)—but, even here, 1934 loadings were materially better than those of 1933. (And politics was plainly the reason why loadings in 1934 did not improve any more than they did.)

Politics Can Kill Good Prospects

Experience since 1932, then, as this chart shows, has been that a strong upward trend of loadings at the end of a year foretells that the next year will be a good one. (Even 1932 bears this out. Its year-end loadings were not so good—but, it will be remembered, the banking crisis came in at this period. Until this difficulty arose, the autumn increase in loadings had been healthy—and it got healthy again in 1933 as soon as the banking situation was cleaned up.) Referring again to the chart, it will be seen that the kind of carloadings behavior which forecasts a bad year to come is one in which the normal seasonal upturn fails to develop in the fall (as it failed in 1934 and 1937). On the other hand, where the fall upturn is unseasonably strong, a good year following can be counted upon (failing the political blight which kept the lid on traffic growth in 1934).

So much then for generalities—1939 promises to be a much better year for traffic and earnings than 1938. But how much better? We invite a glance at the figures at the top of the next column.

These figures show a very close parallel in average weekly carloadings between the last half of 1938 and the last half of 1935. They show almost as close a parallel

	Average Weekly Carloadings		1938 of 1935 % + or -	Net Railway Operating Income in Millions		1938 of 1935 % + or -
	1938	1935		1938	1935	
July	572	564	+1	38.4	26.9	+42
August	598	626	-4	45.4	42.2	+7
September	638	657	-3	50.4	57.4	-11
October	711	713	..	68.6	75.5	-9
November	632	626	+1	*50.0	54.2	-8
December	*580	586	-1	*40.0	46.0	-13
Total	3,731	3,772	-1	292.8	302.2	-3

* Estimated.

between net railway operating income in the latter months of 1938 with the same months in 1935—but not quite the same parallel, because wage rates and some other operating costs and taxes are higher now than they were in 1935. The closeness of the parallel of carloadings between the latter half of 1938 and the latter half of 1935 is further shown by Chart II.

Conditions Now Closely Parallel 1935-36

Now, we know from past experience that the volume of loadings we had in the latter half of 1935 was the forerunner of a 1936 carloadings total of 36 millions. Is there any very good reason why the kind of loadings we have been having recently should not prove to be the forerunner of loadings of 36 million cars in 1939? We believe not. Take, for example, the estimate of the Shippers' Advisory Boards. They forecast that, in the first quarter of 1939, freight loadings should total 10 per cent

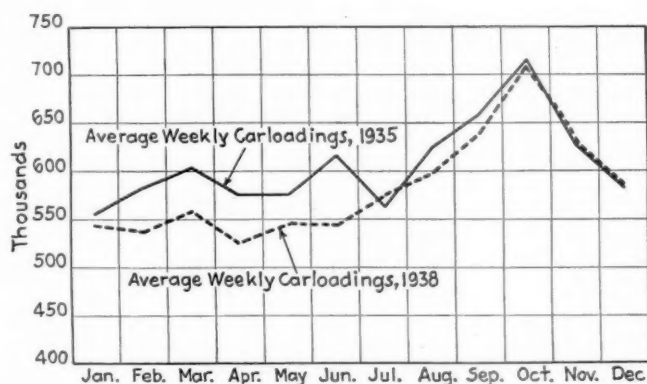


Chart II—The Loadings Parallel Between The Second Halves of 1938 and 1935

more than in the first quarter of 1938. If this prediction comes true, then loadings in the first quarter of 1939 will be only about one per cent less than they were in the first quarter of 1936.

In our issue of December 3 we quoted the eastern editor of "American Builder" as predicting that residential building in 1939 would be from 25 to 35 per cent above 1938. We quoted the editor of "Iron Age" as predicting an increase of about 74 per cent in iron and steel production in 1939; and the directing editor of "Automotive Industries" who foretold an increase of from 25 to 30 per cent in automotive production. In a copyrighted article published on Christmas Day, the North American Newspaper Alliance quoted the editors of a number of business publications on prospects for the coming year. All of them were optimistic and typical of them was a prediction by the editor of "Business Week" that in 1939 industrial output "could easily be 20 per cent ahead of 1938." Now it so happens that a

(Continued on page 9)

Will Liberal Loans Be Offered?

Without passing on the question whether the government ought to lend liberally to the railroads, or whether the railroads should borrow, what is likely to happen? Evidence cited herein indicates that *some* government opinion and *some* railroad opinion favor such loans. Instances are cited where the carriers could spend money to their profit and that of their patrons, contributing to national recovery, if funds were available on favorable terms.

IN the article immediately preceding this one we have examined the probabilities of railway traffic and earnings in 1939—purely on a basis of the present political situation of the railroads remaining unchanged. And in that article we endeavored to indicate how the prospective improvement in earnings would probably be translated into larger purchases from the manufacturing industry. Now, there are several developments which might occur which would considerably increase the purchasing power of the railroad industry above that which we have indicated as probable in the preceding article. These potential developments are the following:

1. A more liberal policy of government loans to the railroads for maintenance and rehabilitation.
2. Changes in the Interstate Commerce Act which would ease the railway's competitive handicaps, and enable them to secure more traffic and improve their earnings on the traffic they already have.
3. The government's program for increased armaments—which might include some provision to make the railroads better prepared to meet a war crisis than they are at the present time.

In this article, and the two articles which immediately follow, we examine each of these possible developments in turn—both with regard to the possibility of their occurrence, and what their effect might be on the railroads' contribution to general recovery by larger purchases from the manufacturing industry. The matter under examination in this article is that of the proposal that liberal terms be granted to the railroads by the R. F. C. on loans for the purchase of equipment or for catching up on back maintenance.

Would Railroads Accept the Money, If Offered?

Our purpose here is analysis only. We do not write either as advocates or opponents of such a program. We inquire merely: Is it likely that the government will offer loans to the railroads on liberal terms? And, if

the government does make such loans available, will the railroads take advantage of them or not? This last is not an idle question, because there is plenty of advice going around from good conservative sources which urges that government loans are no answer to railroad difficulties; that, if the industry is placed on a sound self-supporting basis it can get all the money it needs from private investors; and that, if the industry is not going to be put on a sound basis as to earning power, then it has not got any business borrowing any money from anybody.

Be that argument sound or not, what is the evidence as to the likelihood of government loans? Well, as to the first question—whether the government is likely to offer the railroads loans on liberal terms? The most significant hint along this line that we have seen is the recent questionnaire issued by the Interstate Commerce Commission on December 12 asking each railroad to enumerate specifically the nature and extent of the maintenance and capital expenditures which would be required to enable the roads in 1939 to handle the volume of traffic they actually handled in 1937. Replies to the questionnaire are expected to be in the Commission's hands by January 15.

We pretend to no inside information as to why the Commission issued this questionnaire. We believe, however, that mere academic curiosity is insufficient to explain it. Somebody around the government must be interested in learning how much the railroads need to effect their rehabilitation. And such an inquiry would not make sense unless the persons instigating it had some thought that the funds needed to effect the rehabilitation would be obtainable from some source. We believe the evidence favors the view that some individuals, either in Congress or the administration, or both, are inclined to favor liberal loans to railroads; and, consequently, that it is quite possible that such loans may be proffered.

Evidence from Committee-of-Six

Proceeding then to the next question: If the government should offer such liberal loans, would the railroads borrow the money? The most persuasive evidence on this point, it appears to us, is the report of the committee-of-six. The committee believes that, for the R. F. C. to be allowed to lend money to the railroads, assurance should not be required as at present that the road is not in need of reorganization—but simply that the borrower stands a reasonable chance of being able to pay the money back. The committee thinks the R. F. C. ought to be allowed to lend money to railroad trustees. As for maintenance loans, the committee recommends not only a very low interest rate but also that the money be lent on security no greater than of making such loans payable prior to the payment of dividends or interest on contingent-interest securities. For equipment loans, the committee believes the R. F. C. ought to make money available at 2 per cent, and lend

up to 100 per cent of the value of the equipment bought, with liberalized terms for repayment.

These proposals are generous indeed, from the borrower's standpoint. As to whether the railroads would take advantage of them or not—we can only observe that, if the railroads do not want such loans, then why should the committee-of-six, which has such close contact with the very center of the industry, propose them? The fact that the committee-of-six proposed such a liberalization of the terms of government lending to the railroads, it seems to us, is about as conclusive evidence as one could ask for that *some* railroads, at any rate, are prepared to take advantage of these terms if they are offered.

What the Money Might Be Used For

As to what sort of expenditures the railroads might profitably make, given the necessary credit, our technical editors offer the following outline, which does no more than hit the high spots—suggesting the kind of evidence which may be available in specific detail when the Interstate Commerce Commission receives the answers to the questionnaires which it has sent out. Some of these high spots follow:

Locomotives

With the exception of 1936 and 1937 railway purchases of new motive power and rolling stock have been negligible since the early days of the depression. At the end of 1936, 31 per cent of the steam locomotives were 29 or more years of age and less than 30 per cent have been built since the end of 1919 (17 years of age or under). In the case of switching power more than one-third were 29 years of age or older and less than one-fourth have been built since the end of 1919. Following the purchases of locomotives in 1936 and 1937 the locomotives built since the end of 1919 still amount to only 30 per cent of the inventory.

Instances have occurred where new freight locomotives of the high-horsepower-capacity type capable of hauling heavy trains at high speeds have paid for themselves in four or five years. The demands for increasing speeds in passenger service call for locomotives which are adapted for fast running without causing excessive wear and tear on the track or on the locomotive itself. With nearly one-third of the locomotive inventory still close to 30 years of age or over and 70 per cent of it 19 years of age or older, the opportunities for reduced expense and improved operation from the investment in new power are obvious.

Take the case of Diesel switching locomotives for instance. There has been a steady increase in the proportion of total switch-engine hours which are produced by Diesels for several years. From less than 2 per cent in January, 1937, the proportion of Diesel-engine switching hours to the total yard engine hours has now increased to nearly 5 per cent. Furthermore, this service is being rendered by about 2 per cent of the total switching locomotive inventory. It is thus evident that the surface of the possibilities for improvements in economy and service which the Diesel-electric switching locomotives have demonstrated for themselves has scarcely been touched.

Freight Cars

Freight cars have been permanently retired during the past eight years at the rate of over 80,000 per year, with new installations of about 20,000 cars per year. There has thus been a steady decline in the total number of cars

on line. The cars at present available are adequate for a peak loading of about 850,000 cars per week without the danger of car shortages. This is little more than the peak volume of traffic actually handled during the fall of 1937. It is evident the total supply of cars available for the peak movement next fall, according to present trends, will not be sufficient to handle more than the fall peak of 1937, and will scarcely do that without scattering car shortages. A basic level of from 15,000 to 20,000 new cars are purchased each year, irrespective of how low traffic levels may be. Should traffic levels rise above those represented by the fall peak of 1937, purchases would have to be increased to avoid shortages. With a prospective fall peak of 900,000 cars per week, from 90,000 to 100,000 additional cars would be required.

However, the improved credit of the railroads which would result from such traffic levels would undoubtedly add materially to the car orders in the interests of reducing obsolescence and might well produce a market for from 40,000 to 50,000 additional cars during the year. Such an addition to the market might also be effected if credit were available even if traffic levels did not exceed those of 1937.

The modernization of freight cars, such as the replacement of the present freight-car brakes by the new AB brake is also much in need of prosecution. It is the intention of the Interchange Rules to have all freight cars equipped with the new brake by January 1, 1945. Up to the present time these brakes have been applied at a rate scarcely one-third that required to meet this schedule.

Passenger Cars

Railroad history is fairly consistent in showing the rapid installation of any development in passenger-car construction or appointments which meet with popular approval. This was evident in the rapidity with which air conditioning was installed in passenger cars following demonstrations of modern installations in 1930. In nine years more than 11,500 passenger coaches and Pullman cars have been so equipped, notwithstanding the fact that the period spanned one of the worst depressions the railroads have ever been through. Similarly, since the first lightweight streamline train for operation on fast schedule was installed in 1934, a total of 85 such trains have been installed. With a return of credit, not only will there be a marked stepping up in the purchase of new equipment of lightweight construction, but there will also be a marked increase in the prosecution of rehabilitation programs. Further cars of all-steel construction will be air conditioned, the lighting will be modernized, modern seats installed, and the cars fitted with lounge and toilet facilities of the type to which the public has already become accustomed through its contact with the new de luxe trains.

Structures and Track

Because so many facilities now need expansion or revision, or both, it is difficult to say just what class of improvements will yield the greatest return. Among the demands which stand near the head of the list is the revision of engine terminals, including enginehouses and locomotive handling equipment, facilities for the delivery of water, fuel and sand, etc. In many cases boiler-washing facilities are obsolete or non-existent. The modernization of engine terminals will yield a large return on many roads.

Shops, like engine terminals, are among the first railway facilities to feel the effect of fluctuations in traffic; furthermore, there is no type of facility that becomes

obsolete sooner than shop plants and shop equipment. For this reason many roads can effect large savings by constructing new shops or rebuilding existing layouts and equipping them with modern machine tools.

Another phase of terminal improvements which will yield large returns on many roads is the reconstruction of existing classification yards, particularly to provide for hump switching, car retarders, scales for motion weighing, etc. On not a few roads the reconstruction of facilities for the repair of freight cars will yield large returns, both in the more efficient conduct of this work and in making possible the more prompt forwarding of cars under load.

With the continued purchase of new locomotives with larger tanks and with the increasing demands for shorter overall schedules, has come a demand for the revision of water facilities. For years water has been delivered to locomotives at the rate of 1,500 to 2,500 gal. per minute, and engine tanks with capacities up to 22,500 gal. require as much as 15 minutes to fill. To reduce these delays, water delivery facilities are now being built to deliver up to 5,000 gal. per minute on some roads, and are under consideration on others. These higher deliveries lead in turn to the reconstruction of treating facilities to provide for the larger draft, while the larger locomotive tanks make it economical to respace water stations and provide larger storage supplies. Furthermore, with lengthened engine runs, water treatment is no longer a problem of the individual station, but of entire districts to insure more uniform water over these extended runs. Investment in the improvement of these facilities yields large returns in reduced cost of operation.

For years grade reduction constituted one of the major types of construction and while there are still many instances where investment in such work will yield large returns, the initiation of extra high speed schedules for passenger trains has brought with it a demand for the reduction of curves to as low as 1 deg. and 1 deg. 30 min. to avoid the restriction of speeds, which can no longer be tolerated. Although this work is as yet in its infancy the need is growing rapidly and curve revision is a necessary corollary to high speed operation.

In still another direction, through the purchase of work equipment for maintenance of way operation the railways can effect marked economies. The widespread acceptance of such equipment in recent years comprises one of the outstanding developments in railway practices.

Signaling

Automatic signaling is justified on 6,000 miles of line not now so equipped, but the great opportunity in this field is to utilize new systems of signaling such as modern interlocking, remote control, centralized traffic control, cab signaling and car retarders. Many projects of this character will not only expedite train and yard operation but also will reduce operating expenses sufficient to return the investment in from four to six years.

In order to determine the volume of this work that should be done, a survey was made of 31 roads (including large, average and small roads) with varying types and volumes of traffic, to determine if adequate funds were available, how much money they would be warranted in spending on a sound economic basis for modern signaling facilities. Some roads reported that the opportunities were vast, but that they had no definite figures available. Twenty-one roads reported, however, that they could spend \$15,853,000 to install various systems of modern signaling which would be justified on the basis of expediting traffic and reducing operating expenses. The total length of main line involved in

these projects is 20,800 miles. Giving consideration to certain practical limitations, it is estimated, from this information, that the roads as a whole could spend to advantage more than twice as much money as the 20 roads mentioned previously, and \$35,000,000 has, therefore, been set up as a conservative amount which could be spent justifiably in 1939 for new automatic block signaling, interlockings, cab signaling, centralized traffic control and car retarders.

The only reason that certain extensive installations have not been made is that the funds for capital expenditures are limited. Roads which have fair earnings during 1939 will utilize some of these funds for signaling installations, while other roads which are less fortunate will be further handicapped by a lack of proper signaling improvements. If the federal government can loan these railroads funds with which to make these signaling improvements, the traveling and shipping public would be benefited, and the savings effected by these projects could be turned back to repay the loans. Men would be employed by manufacturers in building the equipment and by the railroads in installing and maintaining the signaling systems.

What Will Earnings Be in 1939?

(Continued from page 6)

20 per cent increase in carloadings over 1938 would be exactly what the railroads need to produce the 36,000,000 loadings which were shown in 1936.

What Earnings Would 36,000,000 Loadings Give?

An "educated guess" that loadings in 1939 ought to touch 36,000,000 therefore, seems to gee pretty well with what the experts are forecasting for the probable increase in industrial production.

Now, if the railroads should happen to hit 36,000,000 in loadings in 1939, what would their net railway operating income be? Experience in recent months (see table) shows that the roads are able to turn carloadings into net railway operating income about (but not quite) as well as they did in 1935. But, in 1936, loadings of 36,000,000 produced net railway operating income of 667 million dollars. Shave that figure 2 or 3 per cent—and the result is what the roads ought to earn today with 1936 loadings. Hence, it looks to us as if a prognostication of 600 millions of net railway operating income for 1939 errs, if at all, on the side of conservatism.

Such earnings are not enough to take the railroads out of their difficulties—but net railway operating income of 600 millions would be about 239 millions more than was earned in 1938. And, as previous experience has shown, every dollar added to net railway operating income means slightly more than a dollar of additional purchases by the railroads from the manufacturing industry.

So that is what 1939 looks like to us—even without any loans on easy terms from the government, or without any expenditures to equip the railroads for national defense, or without any legislation to remove any of the competitive injustices under which the railroads now labor. Maybe the situation may be ameliorated by legislation. If so, the 600 millions of net railway operating income and even more than that in purchases from manufacturers might be largely exceeded. On the other hand, other political factors might come in to diminish earnings, but we don't know what they would be.

What Chances Has Legislation?

The only legislative proposals which promise to have easy sailing in the present Congress are those which are non-controversial. Yet it is only the controversial and hard-to-pass measures which can yield any genuine relief. Whether a real remedy to railroad ills is to be achieved in the present Congress, therefore, depends upon the extent to which friends of the carriers will rally to oppose the politics of the pressure groups, which wax fat upon railroad starvation.

THIS article examines what, if any, appear to be the chances that legislation will be enacted at the session of the Congress which opened this week which will improve the railways' financial position (and their employing and buying power), over and above such improvement as might be expected without any new legislation. In the first article in this issue—following the leading editorial—we have examined briefly what seem to be the prospects of the railroads for the year 1939 without anything being done politically to give them a more even break than they now enjoy. In the second article herein (the one immediately preceding this one) we inquire into the likelihood of the government's becoming somewhat more liberal than it has to date with its loans to railroads. Complementary to the discussion of that question, we also get into the matter of what the railroads might spend borrowed money for, if a lot of it were made available on easy terms.

Thus, in the two articles which have preceded this one, and now in this article, and in the one immediately following (which discusses the railroads' relation to national defense) we endeavor to cover all the major factors which are likely to have a bearing on the fortunes of the railroad industry, its employees and the industries it patronizes in the year 1939.

So, now, to get down to the subject at hand: What chances are there that legislation for the relief of the railway industry (other than government loans) will be enacted in the coming months? If the chances are good, what kind of legislation is most likely to succeed—and what, if any, specific good will it do to the financial status and the employing and buying power of the railroads?

We have no inside information to offer in answer to these questions. There is a considerable volume of respectable opinion which holds to the belief that there will not be any legislation in 1939 which will be of any material benefit to the railroads. This opinion takes cognizance of the fact that when, this past autumn, the

railroads dropped their project for a reduction in wages, President Roosevelt virtually gave his word that he would support a program for legislative relief of the rail carriers, provided railroad managements and organized labor would agree upon a program for such legislation. The President himself appointed a joint committee of managers and labor executives (the now-famous committee-of-six) to formulate such a program, and now this committee has rendered its report—a most comprehensive and able one too.

We Have Had Promises Before

This is all very well, the pessimists observe, but they remind us that President Roosevelt promised to deal definitely with the problem of the railroads as long ago as 1932—and he showed that, even at that time, he fully appreciated some of the principles which the committee-of-six is now urging. Since President Roosevelt was backward about pushing railroad relief legislation when he had a Congress made up predominantly of yes-men, these doubters argue, how can he now expect to secure the passage of a legislative program when he has an at-least-partially-independent Congress on his hands?

We think that argument has enough plausibility to make it advisable at least to consider it in any attempt to get a reasonable guess as to what is likely to happen.

But, we believe, there are at least a few considerations which are worth citing which tend to minimize the weight of this objection—and here they are: In the first place, both Chairman Wheeler of the Senate Committee on Interstate Commerce and Chairman Lea of the House Committee have announced their intention to introduce legislation dealing comprehensively with the railroads early in the present session. Thus it may very well be that pressure for legislative action, which the administration may no longer have the power to give, may find an effective substitute in Congress itself.

Senator Wheeler once or twice has seemed on the verge of readiness to deal constructively with the railroads, only to yield to the temptation to go off on a witch-hunt instead—and we must keep our fingers crossed as far as he is concerned until he gives evidence that he is willing to turn loose some of the real statesmanly power which he demonstrated in the court fight. Mr. Wheeler has the spark of a great man in him—only he prefers to submerge it most of the time. Mr. Lea, on the other hand, is a conscientious and public spirited man, with none of the Huey Long about him—and it is inconceivable that he would enter upon as serious a matter of public business as the railroad situation and turn it into a cheap farce, as Mr. Wheeler did his investigation into so-called railroad financing.

All in all, and after weighing evidence that we have not space to cite, we are inclined to believe that there is more real drive both in the Administration and in Congress toward constructive and comprehensive dealing with the railroad situation than there has been at any

time since the passage of the Transportation Act of 1920. Maybe we are over-optimistic. On the other hand, the statement we have just made is not so very strong at that, because there hasn't been any measurable quantity of constructive interest in the railroads in Congress in most of the past 18 years. So, to say that there is more of such interest now than there has been since 1920 is not of itself an argument that a constructive legislative program really has a chance.

Assuming, just for a moment, that *some* beneficial legislation may have a chance of passage—what are the most likely to make the grade of all the proposals that have been made? There is no more convenient summary of the proposals than that presented by the report of the committee-of-six. The committee-of-six recommendations include most of the important ones which others have made, except that none are made for dealing more satisfactorily with labor relations. Putting these aside for the time being, and concentrating solely on the recommendations of the committee-of-six—just which of the proposals made by this body are most likely to be enacted into law, assuming that there may be at least *some* legislation?

Well—there are some of the proposals of the committee-of-six that are not very controversial. It recommends, for instance, that there be some reorientation of duties in the Interstate Commerce Commission, including the setting up of a new transportation "planning" body. Even in the Commission itself there seems to be considerable opinion in favor of a change in this direction—so maybe something will come of it. The long-run favorable effects of such a change in the regulatory machinery as the committee-of-six has recommended would be very great. Nevertheless, such a change would probably not have any very great immediate effect; and, moreover, there are pressure groups which would eventually lose their half-Nelson on the railroads if this change were effected. We do not delude ourselves into the belief that they will let go without a fight

These Measures May Be Enacted

There also seems to be fairly general agreement that there should be some revision in the rule of rate-making, but here again the probable tangible results are pretty hard to estimate—at least until the final draft of the proposed changes is available.

Relieving the railroads of the cost of reconstructing bridges when waterways are improved, and throwing out the land-grant rates, are two of the committee's proposals about which there is little opposition—and which ought to stand a pretty good chance of enactment. On the other hand, they alone are not important enough to change the railroad situation from a famine into a feast.

There are a couple of other of the committee's recommendations which, while somewhat controversial, still probably do not arouse the opposition of particularly determined pressure groups, and hence they may stand fairly good chances of enactment. These are the proposal for the revision of the sections of the Interstate Commerce Act which have to do with reparations, and that for extending the powers of the Interstate Commerce Commission over intrastate rates. Also, it might be possible to secure the enactment of measures giving the railroads some degree of tax relief, and free them from expenditures for grade crossing elimination. But, here again, no insolvent railroad will become solvent merely by the enactment of these proposals.

Recommendations that a special reorganization court be set up, and that the law with respect to consolidations be changed ought to have a fair chance of passage, in our

opinion, but, here again, while the long-run effects might be important, their tangible effects are pretty much anybody's guess—at least until they are reduced to specific form.

These Measures Are Needed for Real Relief

Over and above all these measures there remains a considerable grist of proposals which are out-and-out controversial, but the enactment of which could not fail to be of immediate and important help to the railroad industry. These are:

1. The adoption of a definite national transportation policy, to insure impartial treatment of all the agencies of transportation.
2. Extending the jurisdiction of the Interstate Commerce Commission to include all agencies of transportation.
3. The repeal of the long-and-short-haul clause.
4. The transfer of all the government's promotional activities regarding transportation to a new "transportation board."
5. The imposition of tolls on the inland waterways.

These recommendations go right to the very heart of the artificial and onerous handicaps which the railroads have to face in meeting competition. There are one or more powerful pressure groups which will battle to the death against the enactment of practically every one of these proposals. No amount of good-will toward the railroads on the part of Congress or the Administration (we hazard the guess) can possibly avail to get a single one of these measures enacted into law unless there is brought into being a political demand in behalf of this legislation on the part of individual voters numerically stronger than the votes that the pressure groups are able to muster in the defense of their special privileges.

Right here, as we see it, lies the answer to whether the railroads are likely to receive any tangible and early benefit from legislation enacted in their behalf. If organized railway labor is determinedly behind the recommendations of the committee-of-six and will explain and advocate these proposals to its members through the union publications, then a considerable political force may be built up to offset that which the pressure groups interested in competing agencies of transport have already built up. If the railroads also will carry on an intensive campaign of education—first, among their own employees, and, secondly, among the shipping and traveling public, then the power of the pressure groups who will battle for the *status quo* may be offset.

Will Managements and Labor Truly Co-operate?

In short, the way it looks to us, the only proposals which have been made for legislative relief of the railroads which promise any genuine tangible benefits are the controversial proposals. And whether the controversial proposals have a chance of enactment or not is a question which is largely up to the railway labor executives and to railway managements. These proposals are in the public interest and can be "sold" to the public with a clear conscience. But they are not the sort of thing the public knows about automatically.

If someone can inform us that the railway labor leaders and railway managers are going to carry on a vigorous program of education among railway employees and the public regarding these controversial proposals, then we will be ready to predict that legislation in 1939 may accomplish something of tangible value for the railroad industry. Without such information, we cannot make such a prediction.

Railroads and National Defense

Any realistic industrial mobilization program should bring a "do-it-now" urge to carrier-rehabilitation proposals

WHATEVER may be its final form and extent, the Roosevelt Administration's national defense program, if it is to be developed along realistic lines, cannot but have a favorable influence upon the railroad situation. Adequate and efficient transportation facilities must be the *sine qua non* of effective industrial mobilization for war. Just what the defense program as a whole will contemplate is a matter of wide speculation; from the initial expectations of a "Fourth New Deal" with aspects of pump-priming expenditures it has lately been getting within the narrower bounds of a pay-as-you-go proposition. In any event it is expected to bring about some shift in Administration emphasis from consumer goods to durable goods industries, and to occupy a major part of the present session of Congress.

Administration officials in recent weeks have been surprisingly outspoken on some phases of the program, scrupulously uncommunicative concerning others. The railroad phase is one of the latter. Responsibility for the industrial mobilization program falls upon Assistant Secretary of War Louis Johnson who has been delivering numerous addresses on the subject before various organizations in all parts of the country. As yet, however, he has made no "railroad speech."

Transport One of the "Bottlenecks"

Mr. Johnson likes to call the industrial mobilization program one of "clearing bottlenecks." Among the "bottlenecks" to which the War Department has thus far given its attention is that of organizing industrial plants for the production of wartime necessities. In that connection thousands of plants have been inspected and earmarked as sources of specific materials. Along the same lines are plans for assuring an adequate number of skilled airplane mechanics, and the recent lining up of the utility companies for the expansion of generating capacity to provide adequate power reserves in war-material producing centers.

It is understood that transportation is another "bottleneck" not far below the foregoing on the War Department's list. The Department realizes that it must have the railroads in "tip-top" shape; it has no idea that other agencies have developed to the point where wartime transport needs could be met without an efficiently-functioning railroad system. On the other hand it has not yet got around to announcing definite plans for clearing the railroad "bottleneck." One reason for the delay, no doubt, has been the preoccupation with other phases of the program; although another is perhaps the feeling that while the railroad problem has its vital national-defense angle it also has many other aspects. And this complication may well have fostered what appears to be the War Department's current disposition to await from other sources a general railroad rehabilitation program which could be topped with a national-defense touch. Thus it is difficult to predict what form of government aid may be extended for the purpose of rehabilitating the carriers in the interest of national defense. Loans on liberal terms, guarantees of net income and subsidies have been suggested; but amidst the va-

riety of ideas is the virtual unanimity on what President Roosevelt in other connections has often called "agreement on objectives," i.e., that something must be done about the railroads if the industrial mobilization plans are to be rounded out in realistic fashion.

It is also, of course, a matter of opinion as to what the national defense program should contemplate in railroad rehabilitation work over and above that needed to put the carriers in shape to meet and anticipate the country's normal commercial transport requirements. In its recent report, President Roosevelt's railroad committee-of-six emphasized the "essential part" which railroads must play in the event of war; while the "Survey of Transportation in the United States," which accompanied that report, found that "To place the railroads and other agencies of transportation on a sound and equitable commercial basis will not only make them able to meet the normal demands upon them for traffic, but will also place them in position to meet extraordinary demands that may grow out of a state of war." There is other respectable authority in the industry for such a view, i.e., that a wartime set-up would create no difficulties if the railroads prior to the emergency had been able to follow their traditional policy of keeping the development of their facilities a few jumps ahead of the anticipated growth in normal traffic. Persons holding this view point out that increases in freight traffic brought about by a national emergency should not, if handled properly, pose problems any greater than come with the present seasonal and cyclical traffic swings, which the carriers have always made it their business to anticipate. Also, the mass movement of troops has been likened to the handling of football crowds, a job which the railroads take in their stride.

No Accurate Estimate of Wartime Load

"If handled properly," however, is a vital "if," since the delays and congestion characteristic of the World War's railroad picture were due in large measure to lack of proper control of the movements. This point has since been driven home to the military authorities time and again by M. J. Gormley, executive assistant of the Association of American Railroads, who has been delivering a "Transportation in Time of War" lecture at the Army War College, Fort Humphreys, D. C., for the past 16 years. As Mr. Gormley put it in one of these lectures—"you should arrange all of the movements on the principle that nothing must be put on a car for storage purposes, and there must be a place available to unload the car without delay at destination." In his latest lecture on November 14, 1938, Mr. Gormley told his audience that he had tried to obtain figures showing what the total war load really amounted to, but he has never succeeded in getting a very reliable estimate. Accepting as an hypothesis one estimate putting the war load at 15,000,000 tons a year, the A. A. R. executive assistant went on to call this an increase in traffic which "would cause no difficulty whatever if handled under proper control."

Assuming then, for the sake of conservatism, that the

railroads will meet any wartime demands if prior to the emergency they have received the rehabilitation required to maintain them as efficient carriers of the nation's peace-time traffic, they still remain a vital consideration in national defense plans. As is well-known, they have not in recent years been able to maintain their facilities in that "ahead-of-the-game" fashion which was their habit in the 1923-1929 period. It has been estimated authoritatively that a 20 per cent cyclical increase in traffic would now bring difficulties, produce car shortages. Thus there is plenty of work to be done, and the national defense program, if its sponsors would face the facts, must influence railroad rehabilitation favorably by supplying the incentive to make now "the acceptable time."

In other words it should create the compulsion to get an immediate start on a program which might otherwise encounter further delay. And if the rehabilitation work is undertaken on the scale and schedule required to make up for lost time, an immediate start would mean making available to the railroads funds—whether from earnings, loans or grants—which would enable them to spend a billion dollars a year.

This billion-dollar-a-year figure is among the latest authoritative estimates of what the carriers could profitably spend during each of the next few years for new freight cars and locomotives, repair of existing equipment and improvement in track and facilities. The figure was used by the committee-of-six and also by R. V. Fletcher, vice-president and general counsel of the A. A. R., in his recent presentation before the Senate finance committee's sub-committee investigating incentive taxation. Specifically, Judge Fletcher said that the carriers could, among other smaller outlays, profitably make annual expenditures of \$300,000,000 for 100,000 new freight cars; \$200,000,000 for 2,000 new locomotives; \$100,000,000 for 2,000,000 tons of new rail; \$90,000,000 for cross ties; and \$10,000,000 for ballast.

History Repeats Itself

A nice piece of business, but all necessary for industry's normal transport needs—and for national defense. In the latter connection evidence that the railroads must be up-to-date on their peace-time programs if they are to meet wartime demands can be found in the situation prevailing during the years immediately prior to the World War. Let the national-defense planners look back upon that picture, and double it for a preview of what might become the railroad history of the next war—if such an emergency should arrive in advance of railroad rehabilitation. A vivid picture of that pre-war situation was included in "American Railroads: Government Control and Reconstruction Policies," published in 1922 by William J. Cunningham, the James J. Hill Professor of Transportation at Harvard University's Graduate School of Business Administration, who served during the war as assistant director of operation on the staff of the Director General of Railroads. Reviewing the 1906-1916 decade, Professor Cunningham said in part:

Critics of private railroad management state that the railroads "broke down" in 1917, just at the time when transportation efficiency was most vitally necessary. If it is true that the railroads then failed in the emergency, we are as much interested now in the causes of the failure as in the failure itself. To get at the causes it is necessary to trace the events of the decade preceding the period of the war.

Until a few years prior to our entrance into the war, it had been the traditional policy of the typical American railroad to keep its equipment and facilities well ahead of the demands of growing traffic. The cost of additional or improved equipment,

and of additional or enlarged terminals, trackage, and other physical facilities, was met either from current income or from the sale of new securities. As a result of this policy, the typical railroad was always equipped to handle its growing business economically. There was an ample factor of safety, so that the ever-increasing volume of tonnage and passengers could be handled expeditiously and without congestion.

The ability to continue this policy depended upon net earnings sufficient to insure ample credit. . . . The law of increasing returns had its full application as the improvements or enlargements in equipment and facilities made it possible, with the larger traffic, to operate at lower unit costs. These lower unit costs enabled the railroads to absorb the gradually increasing wage rates or other additional operating expenses and taxes, and because investors had confidence in railroad securities they were easily marketable.

This situation continued as long as net earnings were sufficient. But the gradual tendency of higher operating costs, coupled with a national and state policy of regulation which tended to reduce rather than to increase rates, soon had the effect of reducing net income. The turning point came about 1906, or coincident with the passage of the Hepburn amendment to the Interstate Commerce Act. This amendment, with its power to prescribe maximum charges, gave the commission complete control over rates. The 1910 amendment went a step further in giving the commission the power to suspend rates. The period, too, was marked by unusual activity on the part of state commissions and state legislatures. Many new laws were passed, nearly all of which either reduced revenues or increased expenses. . . .

Coupled with these adverse influences on net earnings came greater activity on the part of the railroad labor organizations in their demands for higher wages. While the steadily growing burdens of increased operating expenses and taxes impinged upon and forced net income downward, the railroads were unable to convince the government regulating authorities that rates should be increased in a degree which would maintain net income. Consequently it became difficult to appropriate money for betterments, and during the decade which preceded our entrance in the World War the program of extensions, enlargements, and improvements was far below the normal rate of earlier years. Not only were the railroads as a whole unable to raise the funds necessary to equip themselves for prospective increases in traffic, but many were in such financial straits that they found themselves unable to maintain their solvency. The year 1915 marked the peak of railroad receiverships. In September of that year approximately 42,000 miles, or about one-sixth of the entire railroad mileage of the country was in the hands of the courts.

Under such strained financial conditions it was but natural that railroad development should be halted. New construction practically ceased. . . .

The slowing up in railroad development was reflected also in the statistics relating to new equipment. Orders for new locomotives and cars dropped to an unprecedented low level, and drastic retrenchment and curtailment in service were everywhere in evidence.

The spokesmen of the railroads made earnest and continued appeals in an effort to arouse the interest of the public and, through the public, the interest of the governmental regulating authorities in the seriousness of the railroad situation. . . . But the warning and the plea were not heeded. . . .

Management Must Have a Plant to Run

How familiar the foregoing sounds! If the factor of subsidized competition be added to the list of railroad difficulties, and, as stated above, the account of railroad financial distress be "doubled," there emerges a conservative picture of present conditions. It is understood that mobilization plans for any possible future war do not contemplate government operation of the railroads, if it can be avoided; as someone has put it, the government plans to "let management run the plant while government runs the management." All well and good if the government's pre-war transport policies do not remain

(Continued on page 42)



One of Six "Governor" Class Passenger Locomotives Built for the Richmond, Fredericksburg & Potomac by the Baldwin Locomotive Works—The Total Engine Weight Is 406,810 Lb. and the Tractive Force 62,800 Lb.

High Obsolescence Features the Motive-Power Inventory

Only 4½ per cent of the locomotives owned by Class I railroads are less than 9 years old—70 per cent 19 years old or older

THE need for new motive power arises from two basic causes. First, there is the need for an adequate supply to meet the maximum probable traffic demand. Second, there is the need to keep obsolescence from too great encroachment on the inventory.

In an article in the Annual Statistical Number of last year a study was presented which indicated that during 1936 and 1937 the utilization of the freight-locomotive supply had reached an intensity within about 4 per cent of that attained during 1928 and 1929. This study was based on the average miles per month, during October, first, of all locomotives and, second, of the active loco-

utilization in 1937 which was within about 6 per cent of the maximum tractive-force utilization attained in 1929. Both studies indicate clearly the declining reserve of motive power which will be inadequate to deal with a fall peak of freight traffic greatly in excess of that offered the railroads during the fall of 1937.

Obsolescence has been steadily increasing in the motive-power inventory since the beginning of the depression. Five years ago 30,500 locomotives, or 60 per cent of the inventory at that time, were 19 years of age or over. At the end of 1938 30,600 locomotives, or 70 per cent of the present inventory, were 19 years of age or over. Last year 31,300 locomotives—less than 71 per cent—were 18 years of age or over.

The inadequacy of new locomotives installed during recent years to reduce obsolescence, in spite of the sustained retirement program, is brought out clearly by the chart and table showing the age distribution during the years beginning with 1930. In 1930 809 new locomotives were installed. During the entire period of nine years to the end of 1938 fewer than 2,000 new locomotives have been installed.

Almost one-third of all of the locomotives available at the end of last year, and more than one-third of the switching locomotives, were 29 years of age or older.

In the case of locomotives the significance of obsolescence is somewhat different from that in freight cars. A large part of the expenses entailed in the operation of trains are directly affected by the character of the motive power by which those trains are moved. This applies to fuel and crew wages as well as to the cost of the maintenance of the locomotives themselves. In the case of freight cars the expense most directly affected by the character of the rolling stock, assuming that it is provided in adequate quantity, is the cost of its own maintenance. Obsolescence is, therefore, a more compelling factor in determining the attitude of the railroads toward the purchase of motive power than it is in the case of freight cars.

There are two aspects of obsolescence in their effect on the demand for new locomotives. These are the inadequacy of old locomotives to meet modern service

Age Distribution of Locomotives of the Class I Railways, 1930 to 1938, Inclusive

	New locos. installed since 1929*	Locos. installed new 1920-1929, inclusive†	Locos. installed new prior to 1920†	Locos. installed new 1915-1919, inclusive†	Total locos. on line‡
1930....	809	11,184	44,589	8,520	56,582
1931....	995	11,184	42,970	8,400	55,149
1932....	1,090	11,184	41,042	8,273	53,316
1933....	1,111	11,184	38,608	8,145	50,903
1934....	1,195	11,184	35,925	....	48,304
1935....	1,334	11,184	34,064	....	46,590
1936....	1,431	11,184	32,532	....	45,146
1937....	1,797	11,184	31,696	....	44,683
1938....	1,912‡	11,184	30,644‡	....	43,800‡

* From I.C.C. Statistics of Railways in the United States, except 1938 which is estimated.

† Based on I.C.C. statistics.

‡ Estimated.

motives only, the latter in 1936 slightly exceeding, and the former being a few per cent lower than the intensity of utilization attained during 1928-1929. Changes in the basis of reporting have destroyed the comparability of some of the data on which this study was based.

Another indication of the relation of the supply of freight motive power to demand is afforded by the comparison of annual gross ton-miles with aggregate tractive force of the freight locomotives. This is shown in one of the tables and is also plotted in one of the charts. This study shows a yearly intensity of tractive-force

requirements and the growing cost of maintenance with advancing age.

The inadequacy of old locomotives may arise from several causes. The foremost cause is probably the in-

of the Diesel-electric locomotive in that it requires less time for servicing en route and develops higher rates of acceleration at slow speeds, both of which factors are of value when developing extremely high schedules which must be sustained over considerable distances.

More than one-third of the switching locomotives on the Class I railroads of the United States are 29 years or more of age and not quite one-quarter of them are less than 19 years of age. The possibilities for improvements in the character and cost of switching service by the employment of Diesel-electric switching locomotives have been developed during the past 13 years. During the past two years there has been a steady increase in the total switch-locomotive-hours produced by locomotives of this type. From less than 2 per cent in January, 1937, the proportion of Diesel switch-engine-hours

Trends in the Number of Freight Locomotives, the Aggregate Tractive Force and Gross Ton-Miles Handled per Year, 1923-1938, Inclusive

	No. frt. locos. owned Dec. 31	Aggregate tractive force (000)	Gross ton-miles per year (000,000)	G.T.M. per 10,000 lb. tractive force (000,000)
1923.....	40,151	1,793,785	987,326	5.50
1924.....	40,079	1,832,216	954,072	5.20
1925.....	39,453	1,827,207	1,023,370	5.60
1926.....	38,649	1,842,369	1,098,985	5.97
1927.....	37,338	1,815,903	1,086,872	6.00
1928.....	36,251	1,796,379	1,105,889	6.16
1929.....	34,970	1,768,968	1,141,866	6.48
1930.....	34,491	1,775,435	1,006,505	5.67
1931.....	33,829	1,755,779	839,643	4.78
1932.....	32,800	1,719,166	657,309	3.82
1933.....	31,482	1,672,763	685,402	4.08
1934.....	29,477	1,597,000	743,547	4.65
1935.....	28,649	1,567,482	767,517	4.90
1936.....	28,160	1,563,874	896,762	5.72
1937.....	27,770	1,556,345	946,164	6.08
1938.....	26,580†	1,502,227†	785,000‡	5.22

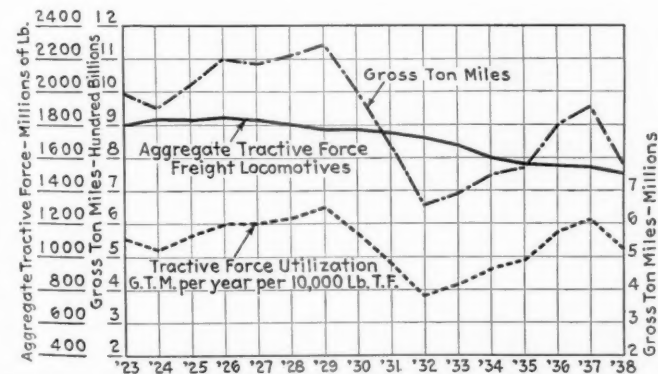
* Electric locomotives not included.

† As of June 30.

‡ Estimate based on 10 months' figures.

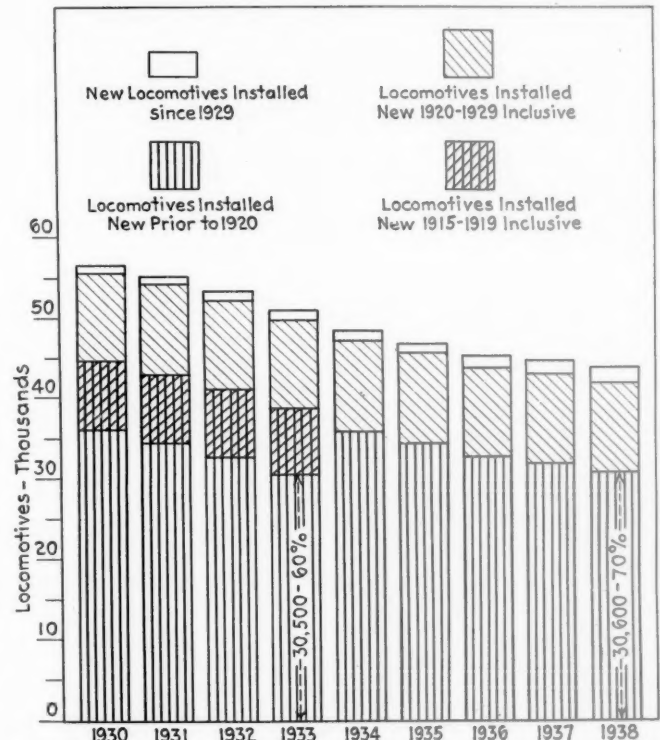
creasing demand for higher speeds both in passenger and freight service. In the case of passenger trains increasing speeds demand better mechanical designs if track maintenance as well as locomotive maintenance itself is to be kept within reasonable bounds. This applies particularly to the design of reciprocating parts and more care in counterbalancing to keep down dynamic augment which, other things being equal, increases as the square of the speed at which the locomotive operates. In freight service higher speeds demand not only the best in mechanical design, but also require boiler capacity for the attainment of high horsepower capacity of the same order as that required in passenger service. In the designs of freight locomotives more than 14 years old little, if any consideration was given to the need for sustained horsepower capacity at high speeds. The improvements in rigidity and the growing tendency toward closer tolerances in working fits which have been established with the bed casting and the roller bearing are factors tending to reduce maintenance costs of locomotives in both classes of service.

In passenger service there is a further factor affecting the adequacy of present motive power for service.



Trend in Gross Ton-Miles and Aggregate Tractive Force of Freight Locomotives 1923 to 1938 Inclusive

This is the demonstrated value of the Diesel-electric locomotives and steam locomotives with stream-styled exteriors to stimulate public interest in revitalized passenger services. There is also the additional advantage



Seventy Per Cent of Locomotives Are Nineteen Years Old or Older

to total yard-engine-hours has now increased to nearly 5 per cent and this service is being rendered by about 2 per cent of the total available switching locomotives.

In attempting to appraise the probable locomotive purchases during 1939 it is evident that the immediate need of additional motive power is a somewhat uncertain factor. However, obsolescence is a much more compelling factor than in the case of freight cars. It may be expected, therefore, that credit will be the predominant factor. With credit available on sufficiently attractive terms there is every reason why the railroads should purchase locomotives at a rate of not less than 2,000 units per year for several years in the future. Such a rate of purchase would be justified by the operating economies to be effected, even though the present supply of locomotives continued adequate to handle the volume of traffic offered. It must not be overlooked, however, that the attractiveness of credit on any terms, as well as the total amount available, will depend largely on the long-term business outlook. With an encouraging immediate trend and a favorable outlook, annual purchases at the rate of 2,000 locomotives or even more are quite within the probabilities. With an unfavorable outlook hand-to-mouth purchases are likely to continue.



All-Steel Box Car of 100,000 Lb. Capacity Built for the Bessemer & Lake Erie by the Pullman-Standard Car Manufacturing Company

Margin of Reserve Freight-Car Supply Again Reduced

Purchases both to increase supply and reduce obsolescence may be sharply stimulated by sustained improvement in traffic prospects

THE present supply of freight cars in the United States is probably capable of handling an average of 850,000 carloadings per week during the four fall peak weeks without danger of shortage. This could probably be increased to upwards of 860,000 carloads with scattering shortages such as were encountered in 1936 and 1937.

Last year the average carloading during the four peak weeks in the fall was 832,000 per week with 1,705,000 cars on line. At that time it seemed possible to have handled a maximum of about 900,000 cars per week with the available supply, if the cars in active service had been increased from the 1,415,000 actually available to 1,500,000 by reducing the cars out of service for re-

pairs to 103,000, or 6 per cent, from the then actual 188,000 bad-order cars. Since car shortages begin to appear when the surplus drops below 130,000, this would have involved the same scattering shortages that were actually experienced because of the low surplus of 102,000 cars.

In the year since October, 1937, the total number of cars on line has been reduced by 32,000 to 1,673,000. By reducing the cars awaiting repairs to 6 per cent, or 101,000, and surpluses to 130,000 cars, an active supply of 1,442,000 could have been made available. The most intensive utilization on record is that of 1928 and 1929 which was just under a weekly loading of one car for each 1.7 active cars. A further loading of 10,000 to

Trends in Freight-Car Supply and Freight-Car Utilization

	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	Probable maximum utilization (without shortage)
Peak loading (000)*	1,184	1,186	960	768	635	658	641	721	820	832	711	850
Cars on line (Oct. 1) (000)	2,238	2,223	2,226	2,178	2,118	2,019	1,908	1,834	1,743	1,705	1,673	1,673
Surpluses (minimum)	86,000	107,000	389,000	532,000	545,000	377,000	318,000	208,000	112,000	102,000	139,000	130,000
Awaiting repairs (Oct. 1)	148,000	133,000	157,000	194,000	262,000	295,000	296,000	284,000	242,000	188,000	231,000	101,000
Active cars (000)	2,004	1,983	1,680	1,452	1,311	1,347	1,294	1,342	1,389	1,415	1,303	1,442
Cars on line per weekly carload	1.89	1.88	2.32	2.84	3.34	3.07	2.98	2.55	2.13	2.05	2.35	1.97
Active cars per weekly carload	1.69	1.67	1.75	1.89	2.06	2.05	2.02	1.86	1.70	1.70	1.83	1.70
Car shortages	Sept. 23-Oct. 22†	Sept. 23-Oct. 31†	None	None	None	None	None	None	Sept. 30-Dec. 30	Jan. 1-July 31	None	.....
Maximum shortages reported	454	.....	.....	.....	.....	.....	.....	.....	836	3,035	.....	.....

* Average of four highest consecutive weeks.

† Small shortages, each aggregating fewer than 100 cars, were reported during a number of weeks earlier in the year.

15,000 cars a week might be added to the 850,000 with scattering shortages.

Evidence of the narrowing of the car-supply margin may be seen in the decline in the number of cars permanently withdrawn during the past two years. The permanent retirements for the past 11 years have averaged well above 80,000 cars per year. During 1937 the number had declined to 69,000 and last year retirements are estimated to have declined still further to about 42,000.

When considering the need for new freight cars the adequacy of the supply presents only half the picture. Obsolescence has been steadily accumulating during the years of the depression through lack of adequate installations of new cars. Furthermore, during this same period have occurred a number of developments which have materially accelerated the rate of growth of obsolescence. These are the new alloy steels, which, together with the developments in the use of welding in fabrication, have made possible material reductions in weight, and the improvements in detail designs, particularly of trucks. The new AB brake also operates in the same direction. Although it can readily be applied in replacement of existing brakes on cars already in service, it operates as a factor tending to favor earlier retirement and replacement of cars than otherwise would be the case.

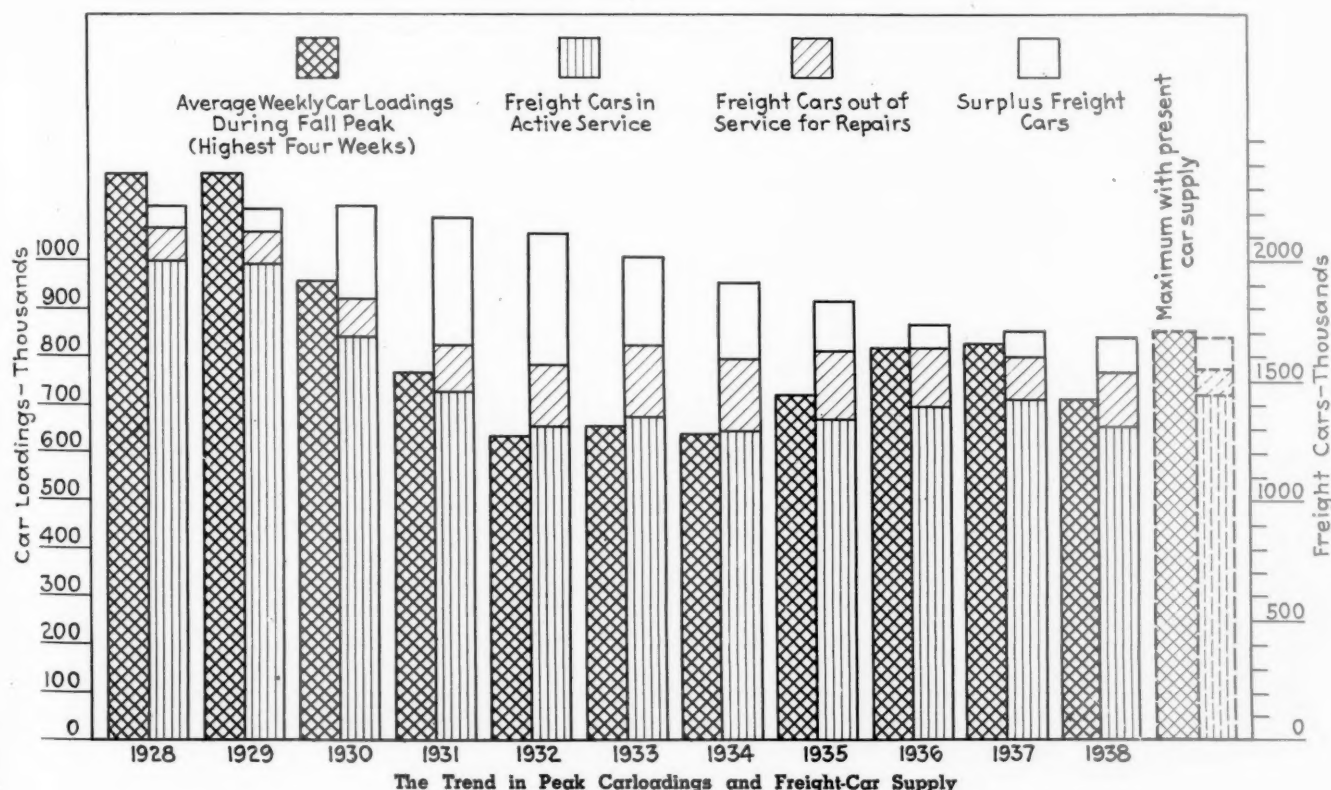
What do these facts signify with respect to the future

ments as suggested above, shortages would be evident in 1940.

Third, any prospective increase in traffic above the 1937 level would make the present margin unsafe.

It must be kept in mind that the fall peak volume of traffic is that which determines the general adequacy of the supply. Hence, good traffic prospects during the first half of the year which do not carry over into the second half are weak stimulants of the freight-car market. On the other hand, the needs of the railroads are not controlled by average conditions, but by many variations in kind of traffic, in the time when cars are most needed, and in the general adequacy of the local car supply. Hence, as the margin of reserve becomes as narrow as it is at present, scattering demands for more cars show themselves in increasing amount.

Any improvement in traffic prospects, therefore, will be reflected in some increase in the freight-car demand above a nominal yearly minimum of say 10,000 cars or less. With a probable return to a volume of fall traffic equal to 1937, not only will this factor operate, but the improvement in net railway operating income will tend to increase replacements to reduce obsolescence. Together, these influences may conservatively build up a demand of 50,000 to 60,000 cars. With a prospective fall peak of 850,000 to 860,000 carloads a week—the limit of capacity with the present car supply—both these



purchases of freight cars by the railroads? The answer to this question depends upon general business conditions and their effect on traffic levels. Assumption of three general possibilities will be sufficient.

First, with a continuance of traffic at the low levels of 1938 purchases might not exceed 10,000 cars a year and, if retirements continued at the rate of 40,000 a year, there would be no shortage before the eighth or ninth year.

Second, with the prospect of a return of traffic to the 1937 level and the same minimum purchases and retire-

influences would be further stimulated and a demand for 80,000 to 100,000 cars a year would probably result.

A similar market might result if additional credit were made available on attractive terms, provided, of course, that the course of business were not too discouraging.

It is doubtful whether a demand for new cars of more than 100,000 per year may be anticipated until there is a prospect for traffic in volume much greater than that indicated by present trends. Indeed, it may be questioned whether more than that number is within the capacity of the industry during the next year.

Shop Tool Needs Emphasized by Repair Demand Prospects

Tangible value of modern repair facilities provides justification for further installations—Step-up in industrial activity may increase difficulty of procurement

FOUR things stand out as being of major importance in connection with railway machine tools and shop equipment at the beginning of 1939: (1) The need of the railroads for new shop equipment has been increased by the pressing demands for reductions in operating expenses; (2) the appreciation, on the part of the mechanical officers and supervisors, of the value of modern cost-saving shop equipment has been greatly enhanced by the tangible results of the installations of the past two or three years; (3) shop equipment must compete with other facilities for a share of the funds which are spent for capital improvements (predicted increases in railway net operating income as the result of better business conditions indicate a resumption of buying in this class of equipment); (4) with better business conditions the speeding up of industrial operations plus a practically-assured broad scale program of national defense will undoubtedly make it extremely difficult for the railroad industry to get new units of shop equipment at a time when it may need them the most.

Aside from the fact that the 1938 purchases of machine tools and shop equipment fell off in proportion to all other railway purchases during the past year there are certain impressions to be gained from a perusal of the lists of equipment placed in service in the car and locomotive shops and engine terminals. Since the advent of higher speeds in passenger and fast freight service, the problem of maintaining wheels in serviceable condition has been acute. During 1936 it became evident that many shops were inadequately equipped with efficient wheel and axle machining tools with the result that, during 1937, the number of driving wheel and journal turning lathes and quartering machines purchased was only slightly less than in 1929. In spite of the fact that shop-equipment buying was sharply curtailed, it was noticeable that a substantial number of wheel machining units were ordered during 1938. Electric-welding sets and various types of material-handling equipment were also prominent in the list of purchases.

1938 Purchases Indicate Greater Variety

One thing that was especially noticeable in the purchases of the past year was the great variety of rather new items in equipment for use in railroad maintenance work. There is every indication that the railroad industry is taking advantage of many of the developments of other industries to carry on its work. This is particularly true in relation to inspection and testing devices which are now being used to assure the continued safety of railroad operation in the face of a never ending demand for greater train speeds.

Sufficient new equipment has been installed in railroad shops during the past two or three years to serve as an

indication of the potential savings that may be gained by its use. The question is often asked as to why the railroads do not take advantage, to a greater extent, of the money-saving possibilities of modern shop equipment. Probably the two most outstanding reasons are comparatively simple ones. First, a railroad company, unlike some other large industrial users of machine tools and shop equipment, does not, as a rule, have a single individual whose sole duties are those of investigating the costs of shop methods and initiating requests for the purchase of equipment that will reduce those costs, and, second, the representatives of the manufacturers of machine tools and shop equipment, when business is good, are usually devoting the greater part of their efforts to those other industries that use their products in greater volume.

Need for More Intensive Study

There is, therefore, at this time a real need for more intensive studies of the possibilities of modern tools and the manufacturer can be of invaluable assistance in placing before the railroads the facts concerning the types of equipment and the methods by means of which the roads may utilize these tools to reduce costs.

The needs of 1939 in railroad shop equipment are probably going to be more severely evident than they were in 1937 when the volume of rail traffic exceeded 800,000 cars a week, for the reason that the installations of new shop equipment have not, by any means, kept pace with the retirements of obsolete units. Because of this fact, there is little doubt that when business picks up the roads will find themselves in the embarrassing position of facing mounting unit costs of maintenance operations. Modern equipment and methods alone can compete with today's high labor costs.

Early Buying Will Assure Profits

There is every indication that 1939 will witness an upturn in industrial operations which may be greatly enhanced by the plans of the government for a broadened program of national defense. Either of these, or both together, added to the prediction that the building industry will go ahead with increasing volume will place a burden on the railroads to handle an increased volume of traffic. It may be well for those responsible for railway mechanical maintenance operations to take cognizance of the fact that present plans for future industrial operations foreshadow the necessity of competing with other industries, in the matter of price and delivery, for the shop equipment that will surely be needed. The old Christmas slogan "Do your shopping early" may not only enable one to avoid the rush but will assure profitable repair operations.

El Capitan, One of the Popular Trains of the Santa Fe's New Fleet of Modern Streamline Equipment



1938 Added to Travel Comforts

Record inauguration of streamline trains; faster service and mechanical improvements are major developments of the year

IMPROVEMENT of passenger service by introducing a record number of streamline trains, by speeding up schedules, and by mechanical developments to increase riding comfort was the goal of the railroads again in 1938. As a continuation of a program started several years ago, 31 new trains were placed in service, as compared with 1 in 1934, 16 in 1935, 21 in 1936, and 16 in 1937. While full credit is due the railroads for their initiative in installing modern passenger equipment on some of the fastest schedules ever attempted, the car builders and specialty manufacturers also deserve a large share of commendation for developing and perfecting mechanical designs and details without which the modern lightweight high-speed passenger train would still be a dream of the future.

14 Trains Added by Santa Fe

The leading railroad, in number of new streamline trains inaugurated during 1938, was the Atchison, Topeka & Santa Fe, which added 14 trains, thereby making its fleet of 15 the largest of ultra-modern, lightweight streamline fleets in the world. Of these new Santa Fe trains, three are additional transcontinental trains which operate on 39¾-hr. schedules between Chicago and Los Angeles; two are stainless steel streamliners for fast daylight runs between Chicago and Kansas City; one is a lightweight train operating between Los Angeles and San Diego, Cal.; and two are lightweight trains operating between Bakersfield, Cal., and Oakland. All of these are hauled by Diesel-electric locomotives. The remaining six trains, comprising new equipment for the Chief, are drawn by steam locomotives.

Other new trains installed during the year were four Twentieth Century Limiteds of the New York Central; two Broadway Limiteds, two Generals, two Liberty Limiteds and two Spirit of St. Louis of the Pennsyl-

vania; one City of San Francisco of the Union Pacific-Southern Pacific-Chicago & North Western; one Rebel No. 3 of the Gulf, Mobile & Northern, and two Hiawathas of the Chicago, Milwaukee, St. Paul & Pacific, the third set of equipment for this train since May 29, 1935.

In addition to the inauguration of these new trains, several trains were re-equipped, enlarged or modernized. A car was added to the streamliner City of Los Angeles, while each of the Denver Zephyrs of the Chicago, Burlington & Quincy was given another sleeping car. The cars of the Capitol Limited of the Baltimore & Ohio were modernized late in the year, while lightweight equipment was placed in several Pennsylvania and New York Central trains.

In addition to the trains placed in service in 1938, two additional trains have been ordered for delivery in 1939. These include a seven-car, streamline, stainless steel, all-chair-car train of the Seaboard Air Line; and a four-car Zephyr train of the Chicago, Burlington & Quincy. In addition the Chicago & North Western has applied to the court for authority to purchase two "400" trains each comprising 10 cars hauled by a Diesel-electric locomotive. The New York Central and the Pennsylvania also have ordered 80 additional passenger cars from the Pullman-Standard Car Manufacturing Company.

Trains Are Speeded Up

While there was no general speeding up of trains in 1938, the fast schedules adopted were significant. The long distance trains placed on faster schedules were the El Capitans of the Atchison, Topeka & Santa Fe, which were placed on the same 39¾-hr. schedule between Chicago and Los Angeles as the Super Chief. The Twentieth Century Limited of the New York Central and the

Broadway Limited of the Pennsylvania were placed on schedules of 16 hr. between Chicago and New York, a reduction of 30 min. As a result of this action by the Santa Fe and the New York Central, there are now eight, instead of six, trains in the world, all in the United States, which cover 900 miles or more at average speeds of 60 miles per hour or more. Among other schedules shortened this year is that between Chicago and Kansas City by the Atchison, Topeka & Santa Fe when it in-



Unique Lighting Effects in a Diner Provided with Unusual Seating Arrangement

augurated its Kansas Cityan and its Chicagoan. These trains cover the 451 miles between Chicago and Kansas City in 7½ hr., a reduction of 2 hr. in the service between the two cities.

Trends in Construction

The lightweight, high-speed trains placed in service in 1938 represent the ultimate refinements to date in travel comfort and passenger conveniences. Except for one train, built in large part of aluminum alloys, the new trains are almost equally divided in number between those made of high-tensile, low-alloy steel and those made of stainless steel. This construction, in connection with the extensive use of various welding methods in fabricating the car structures, has resulted in weight savings of one-third or more and made it possible to maintain high-speed schedules with 14-car trains and longer without prohibitive motive power requirements.

In general, the trend has been rather definitely away from articulated construction, and six-wheel trucks are used only where made essential by weight considerations which necessitate using the third pair of wheels. Every effort has been made in designing the trucks to insure

increased riding comfort by means of improved swing-motion bolsters, and spring-equalizing systems of special design, also by the extensive use of rubber. Alloy steel truck frames and springs have been largely employed and a great majority of the trucks are equipped with roller bearings.

In one recent four-wheel truck design, elliptic springs have been replaced entirely by coil springs, and hydraulic shock absorbers have been applied to dampen vertical oscillation, as well as "levelizing bars" to steady the bolsters. In this particular truck, rubber bearing pads and bushings are applied at more than 20 points to prevent metal-to-metal contact and thus not only promote easy riding but tend to eliminate noise. Rubber is also used extensively at diaphragm and buffer connections for the same purpose. Still another important factor in smooth train handling has been the development and more general installation of tight-lock couplers and improved draft gears, the latter also in some instances utilizing rubber to good advantage in their construction.

Streamlining, perhaps more accurately called stream styling, has continued in favor, this undoubtedly being due more largely to a desire to attract and please the public than to any expectation of appreciable reductions in train resistance. While round roofs and skirts, or sheets extending below the side sills, have predominated on passenger cars installed in 1938, the skirts have not for the most part been permitted to cover up the trucks, and there has been some reaction against them because of increased difficulty in getting at battery boxes, air-conditioning machinery and other parts under the cars. Another disadvantage that is especially evident in northern territories is that the skirts, which usually bend inward slightly at the bottom, form an excellent carrier for snow, ice, dirt and gravel which accumulate in solid blocks under certain conditions at temperatures below freezing. There is no way of removing this objectionable, and to a certain extent dangerous, material at terminals, except by extensive steaming, which involves considerable delay and expense.

During 1938 an entirely new approach to the problem of passenger car design was afforded in an experimental pendulum-type two-car unit placed in service on a branch line of the Atchison, Topeka & Santa Fe in California, as described in the *Railway Age* of February 12. Features of this car design include a semi-monoque or stressed skin body structure; suspension of the car body on "soft" springs above the center of gravity with consequent tendency for the body to "bank" or lean inwardly on curves; and a truck design with many unique features, including the elimination of moving metallic contacts or sliding surfaces.

Colorful Exteriors and Interiors

In outward appearance, the new trains and cars reflect a definite trend toward the use of color. Typical are the two-tone red cars of the Broadway, the gray cars of the Century and the two-tone blue cars of the Capitol Limited. The car interiors are even more colorful, with finishes in shades of pastels predominating. While interior finishes are generally of steel, wood veneers have been used with marked success. One striking departure from usual practice occurs in the Copper King observation car of the Union Pacific's City of Los Angeles, in which the interior side walls are made of copper-covered plywood or Plymetal panels rubbed to a satin finish, with interior equipment including tables, smoke stands and other accessories constructed of copper bronze. Another striking feature of this car is the provision of "light conditioning" by means of 29 Polaroid variable density windows which

Thirty-One New Lightweight Streamline Trains Placed in Service in 1938

See *Railway Age* of January 11, 1938, page 25, for list of 54 trains installed in 1934-37

Train	Railroad	Between	Placed in scheduled service	Type of motive power	Number of revenue cars	Principal structural material in cars
*City of San Francisco.....	U. P.-S. P.-C. & N. W.	Chicago-San Francisco	January 2	D	14	Aluminum alloys
Rebel No. 3.....	G. M. & N.	Mobile-Jackson	January 16	D	†2	Cor-Ten steel
*Chief (6 trains).....	A. T. & S. F.	Chicago-Los Angeles	January 31	S	12	Stainless steel
*Super Chief.....	A. T. & S. F.	Chicago-Los Angeles	February 22	D	9	Stainless steel
El Capitan (2 trains).....	A. T. & S. F.	Chicago-Los Angeles	February 22	D	5	Stainless steel
San Diego.....	A. T. & S. F.	Los Angeles-San Diego	March 19	D	5	Stainless steel
Kansas City.....	A. T. & S. F.	Chicago-Wichita	April 17	D	7	Stainless steel
Chicagoan.....	A. T. & S. F.	Wichita-Chicago	April 17	D	7	Stainless steel
*Twentieth Century Ltd. (4 trains).....	N. Y. C.	Chicago-New York	June 15	S	12	Cor-Ten steel
*Broadway Ltd. (2 trains).....	Penna.	Chicago-New York	June 15	S & E	9	Cor-Ten steel
*General (2 trains).....	Penna.	Chicago-New York	June 15	S & E	8	Cor-Ten steel
*Liberty Ltd. (2 trains).....	Penna.	Chicago-Washington	June 15	S & E	8	Cor-Ten steel
*Spirit of St. Louis (3 trains).....	Penna.	New York-St. Louis	June 15	S & E	8	Cor-Ten steel
Golden Gate (2 trains).....	A. T. & S. F.	Bakersfield-Oakland	July 1	D	5	Stainless steel
*Hiawatha (2 trains).....	C. M. St. P. & P.	Chicago-Twin Cities	September 19	S	9	Cor-Ten steel

To Be Installed in 1939

Zephyr.....	C. B. & Q.	St. Louis-Kansas City	January, 1939	D	4	Stainless steel
"400" (2 trains).....	S. A. L.	New York-Florida	February, 1939	D	7	
	C. & N. W.	Chicago-Twin Cities	June, 1939	D	10	

D —Diesel-electric.

S —Steam.

S & E—Steam and electric locomotives used on run.

* —Trains of the same name were operated prior to date shown.

† —One combination motive power and revenue car included.

may be adjusted to admit any desired amount of light in accordance with individual requirements by simply turning a knob at each window. These windows are also designed to eliminate glare from sun rays and in fact give an improved view of the passing scenery.

Of equal importance in the improvement of interiors has been the development of lighting, one of the interesting examples being fluorescent lighting units which are said to supply four times the usual illumination with only a small increase in electric power consumption. The lamps are tubular in form and contain mercury vapor. The Milwaukee, without attempting to change its lighting system, succeeded in producing colorful lighting effects by means of special lighting fixtures with colored louvers



Interior of a Modern-Equipped Passenger Coach

which tint the light and give each car a characteristic color atmosphere.

The emphasis on air-conditioning has continued, practically all new passenger cars being provided with modern equipment to heat, cool and condition the air. Among

many improvements in various details of air-conditioning and ventilating systems installed in 1938, one of the most noticeable trends was the increasing use of perforated ceiling air ducts and air delivery sheets designed to deliver cool air into the cars without drafts. In some cars these ducts are located in the center of the ceiling, while in others the entire ceiling is made of the perforated metal. Considerable progress has been made in the development of satisfactory methods of cleaning these air ducts as well as filters, and suitably maintaining the operating units.

A trend toward the increased use of private room accommodations manifested itself in 1938 when the Century and the Broadway were made solid room trains and when five different types of private room accommodations were furnished in their Pullman cars. These include master bedrooms introduced for the first time, new drawing rooms, new compartments, new double bedrooms and roomettes. Each is distinctive in arrangement, decoration and convenience of appointments, and has complete private facilities and individual air conditioning.

Summary

As a result of the many improvements introduced during the year, the modern streamline passenger train may well be said to represent the last word in travel luxury. In private room accommodations may be found the comfort of a deluxe hotel room, while in both sleeping cars and coaches the comforts of a home have been incorporated. Revolving seats with rubber cushions, porter service in sleeping cars and coaches, and spacious lounge cars provide comfort for travelers, while telephone service and dining cars with the atmosphere of a smart restaurant are additional attributes to comfort and convenience.

The indications are that 1939 will see a continuance of railway programs for the improvement of passenger equipment, the orders already placed by the Seaboard Air Line; the Chicago, Burlington & Quincy; the New York Central; and the Pennsylvania and that contemplated by the Chicago & North Western tending to substantiate this conclusion. In view of the favorable public acceptance of the new trains, railroads are apparently more than ever determined to modernize their passenger equipment inventories.



Signals Keep Trains Moving

More Signaling — Greater Benefits

during the majority of this period, the train is consuming main track occupancy time. With C. T. C., including power-operated switches, the main track occupancy time for such a move is reduced about 16 min. where No. 10 turnouts are used and about 20 min. where No. 18 turnouts are used. Thus, in so far as passes are concerned, single track with C. T. C. saves train time as compared with double track using hand-operated passing track switches.

How to Save Time in Meets

When making a change-over, sections of the track can be left as sidings at the exact time-distance locations at which trains would meet or pass, and, furthermore, the sidings can be of sufficient length that the vast majority of meets can be made without the train stopping on the siding. On an existing single-track C. T. C. installation, with half the sidings of 85-car capacity and half of 125-car capacity, a large percentage of the meets are non-stop. With sidings three times as long as the longest train, and located scientifically, at least 90 per cent of the meets should be made non-stop. A freight train taking siding to make a meet under these circumstances, would lose only 6 to 8 min.

Experts contend that, where train operating conditions are adaptable, the removal of second track and the installation of C. T. C. on the remaining track will enable a road to operate passenger trains on the same schedules as before, and will actually reduce the overall time of the freight trains on the average.

It should not be inferred from this discussion that C. T. C. is applicable only to single track. The system is being used on extended sections of double-track and

Make One Track Do the Work of Two

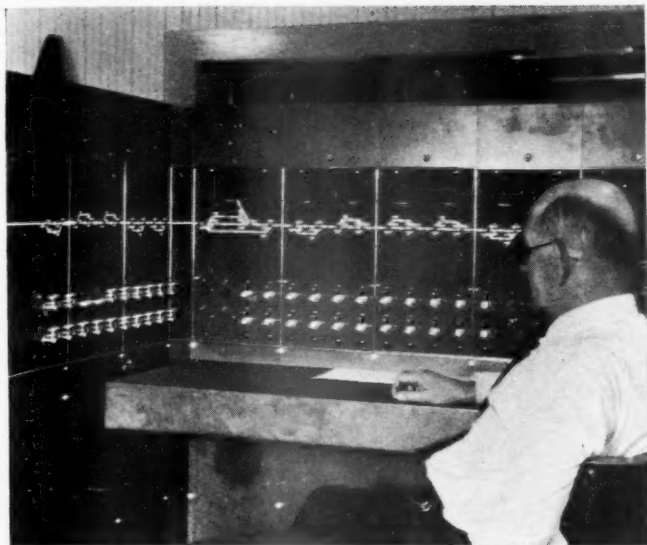
When studying train operation on single-track installations of centralized traffic control, which have effectively postponed the construction of second track, one's thoughts naturally turn to the idea of utilizing one track, equipped with C. T. C., to handle the traffic where two tracks are now in service. At least three large roads have made detailed studies of such a change-over and a project involving the removal of second track on an extended mileage of one road will quite likely be carried to completion in the near future. One of the important reasons for such a change is the desire to eliminate the expense for maintaining the second track. In sections where the rail on one track is due for renewal, immediate action is justified because the salvage value of the rail, fastenings and ties will offset the major portion of the cost of the signaling needed.

Difference Between Passes and Meets

Conversion from double to single track is most logically adapted to divisions on which the preponderance of train movements is in one direction during a certain period of the day, and in the other direction other hours. Under such conditions, involving high-speed through passenger, local passenger and freight trains, the number of instances in which a slower train takes siding to let a train in the same direction pass, predominate as compared with meets of trains moving in opposing directions. On a double-track line, as ordinarily operated with hand-operated switches, a freight train not only loses considerable time when entering and leaving a siding, but a more important consideration is the fact that,

Car Retarders Increase the Capacity of a Yard and Facilitate Operations as Well as Reducing Operating Expenses





With C. T. C. One Man Directs Train Movements by Signal Indication on an Extensive Territory

short sections of three-track lines on the Boston & Maine, the Missouri Pacific, and the Boston & Albany, to provide for train operation in one direction on certain tracks and either-direction operation on one or more tracks. The result is increased track capacity, which defers the construction of additional tracks, or under certain conditions may permit the removal of one track of multiple track.

Other Systems of Signaling

The extension of centralized traffic control presents vast possibilities, but it is only one of several important phases of signaling. Automatic block signaling can readily be justified on at least 6,000 miles of line not now so equipped. Furthermore, the automatic block signaling on 57,083 miles of track has now been in service more than 20 years, and is in need of extensive replacements and rehabilitation to adapt it to requirements of modern high-speed trains. Cab signaling is needed on some lines.

The whole field of interlocking has been revolutionized by the use of simplified line control circuits developed for use with C. T. C. systems, by means of which any reasonable number of switches and signals at remote points can be controlled over a two-wire circuit. Especially at sidings, where the entrance switches are on ascending grades, the use of power switch machines and signals controlled remotely from the nearest open office will not only reduce train delays but will permit an increase in the tonnage ratings of locomotives. Another adaptation of modern control systems is that of the all-relay interlocking which utilizes miniature non-interlocked levers, so that the control of the switches and signals in what were formerly several interlockings can be consolidated on a comparatively small panel of one machine within the reach of a man seated at a desk.

A more recent development, first installed in 1937, is the push button type, route-control machine, which makes it possible to line up an entire route, including switches and signals, by merely pushing two buttons. Four of these route-control plants were installed in 1938. Thus, with the use of modern systems, the possibilities in the field of combining the control of interlockings is almost unlimited. An important means of reducing the overall time of freight trains is to reduce yard delays, which can be accomplished most effectively by the in-

stallations of car retarders and power switches in classification yards. These subjects have been dealt with in great detail in previous discussions, as for example, on page 26 of the *Railway Age* for January 1, 1938.

The extensive application of these various systems of signaling can be an important factor in helping the railroads to return to a more efficient and economical operating basis. The important questions are: How much of this work is there to be done, and how much will it cost? Means for providing funds for the railroads to make these and other improvements are discussed elsewhere in this issue.

What Is Justified?

To develop answers to this question, a survey was made of 31 roads, including large, average, and small roads with varying types and volumes of traffic. The purpose was to determine, if adequate funds were available, how much money could be expended on a sound economic basis to install modern signaling facilities. Some roads reported that the opportunities were vast, but that they had no definite figures available. Two roads reported that the signaling facilities in service were adequate and one of these roads stated that every project in which an appreciable saving could be made had already been carried to completion. On the other hand, 21 roads, which had figures available, reported that they could spend a total of \$15,853,000 to install various systems of modern signaling which would be justified on the basis of expediting traffic and reducing operating expenses. The total length of main line involved in these projects is 20,655 miles.

Knowing that some roads have already completed those projects which showed evidence of the greatest benefits, one could not extend the above figure over the railroads as a whole. Excluding the few roads which are up to date, as well as the 21 mentioned above, a casual investigation of the remaining roads would appear to locate enough projects to easily require a total expenditure of funds larger than can logically be expected to be available. The amount of money that could be spent efficiently is subject to practical limitations. One road reported that it had a great many projects that should be carried to completion, but that it was reporting only those which could be handled within two years, consideration being given to the difficulties of securing enough trained men to prepare plans and perform the construction work, and the ability of the manufacturers to supply equipment and materials.

Giving consideration to all of these limitations, it is estimated that the roads as a whole could spend to advantage at least two and a half times as much money as the 21 roads mentioned previously, and, therefore, \$35,000,000 has been set up as a conservative amount which could be spent justifiably in 1939 for new automatic block signaling, interlockings, cab signaling, centralized traffic control, and car retarders.

Deferred Maintenance a Factor

A rough estimate shows that on 12 average roads a total of \$1,675,000 is required to bring the maintenance of signaling facilities up to normal standards. This figure cannot be applied to the railroads as a whole to arrive at a grand total because the majority of the roads have had funds available to keep the maintenance up-to-date. On the other hand, it is evident that, in many instances, deferred maintenance is a problem which must be recognized, and funds must be made available to correct defective conditions wherever they exist.

Electrical Opportunities

PURCHASES of electrical equipment by the railroads follow the trend of all purchases, but over a period of years there is a constant increment of percentage. Electrical methods continue to supplant others and very seldom is the reverse procedure true. A few things which bear promise of special development are included in the following summary:

Lighting

A renewed interest in lighting has been created by the development of radically different types of lighting units, by a growing appreciation that good light in cars, shops, offices, enginehouses and yards is a good investment, and by an insistent demand for some new applications of lighting. The newest type of lighting unit is the tubular fluorescent lamp. In this lamp a mercury-vapor arc in the tube causes a fluorescent coating on the inside of the tube to glow and produce from two to three times as much light as can be obtained from an incandescent source. This type of unit seems particularly suited to the lighting of passenger cars where power supply is limited, because it produces much light for little power and develops relatively little heat which must be removed by the air conditioning system. The New York Central has one car equipped with fluorescent lighting.

Two other new light sources of high efficiency are the high-intensity mercury-vapor lamp and the sodium-vapor lamp. A few installations of the former have been made in railroad shops, the outstanding example being the installation in the Union Pacific's machine and erecting shop at North Platte, Neb., where mercury-vapor lamps supply an intensity of 25 foot-candles on the working plane. Elaborate plans have been made for the lighting of highway grade crossings. Only a few installations have been made, but when these plans can be put into effect it would appear that the sodium-vapor lamp would be particularly suitable, because of its efficiency and its distinctive color. In the meantime, the efficiency of incandescent lamps has been increased and their cost reduced to the point that they can be expected to carry a major part of the load where power costs are low and there are no special requirements such as those described. Various new features, such as lamps with smaller sized bulbs and silvered-bowl and reflector lamps having a mirrored surface on a part of the inside of the lamp, extend the use factor of incandescent sources.

Wire and Cable

Several new types of wire and cable, such as the nitrogen-filled cable for communication circuits and oil-filled cable for high-voltage underground power circuits offer new possibilities for railroad service. An especially interesting application to railroad service is the use of non-metallic cable (designed for direct burial in the ground) for enginehouse wiring. It should endure many times longer than metallic conduit and make new concepts of lighting and power service possible. The Pennsylvania enginehouse at Harrisburg, Pa., is an example. Glass fibre insulation is another innovation which will reduce

the size of motors and other electrical apparatus. It is highly resistant to moisture and high temperature and may prove desirable for locomotive lighting and train-control wiring. Rubber substitutes will also find their place for portable cables because of their resistance to oil.

Air Conditioning

Passenger cars air-conditioned in 1938 totaled only about thirty per cent of those equipped in 1937. The work of re-equipping cars has evidently passed its peak and more attention will now be given to consolidating the position of air conditioning in railroad service. This will mean revamping of installations put in service quickly to meet operating requirements, standardization of equipment, improving the quality of service, reducing maintenance costs and giving special attention to way-side power facilities and other servicing requirements. Increased passenger traffic may again increase the number of cars equipped in 1939, but it seems probable that additions in the future will consist largely of new cars. Air conditioning of buses in railroad service is opening up a new but smaller field of application.

An innovation in the field of train power supply and air conditioning are the Diesel-electric power plants being applied to each car of a train now being built for the Chicago, Burlington & Quincy by the Edward G. Budd Manufacturing Company. The power plants will supply light, air conditioning and heat, making each car an independent unit.

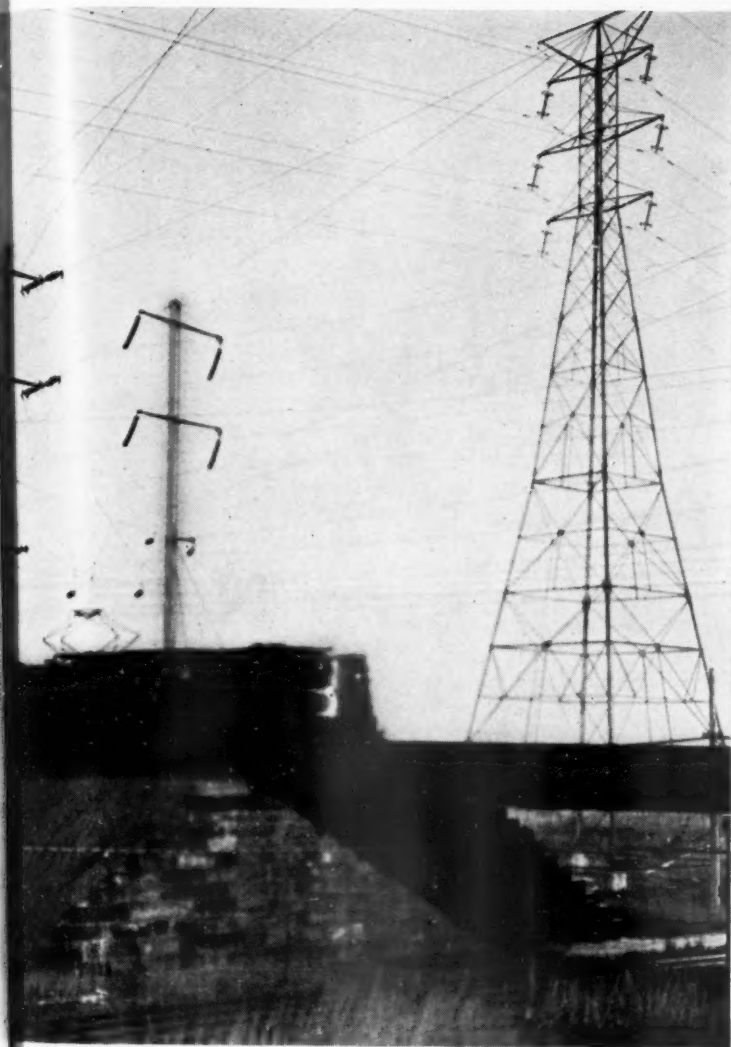
Dry-type rectifiers brought out during the past year offer new possibilities for supplying standby direct-current power for the charging of car batteries and the operation of air-conditioning equipment. These are available for mounting on the car or as portable units for use on the platform.

Locomotives

The Pennsylvania's electrification to Harrisburg, Pa., was completed early in 1938 and that railroad now has 20 additional type GG1 electric locomotives under construction in its Altoona shops. The New Haven fleet of electric locomotives has also been increased by the addition of six new ones. All of these locomotives are the result of a coordinated design, which has resulted in locomotives of unparalleled performance. Electrified mileages are now sufficient to allow for good locomotive utilization and annual mileages of 200,000 are becoming commonplace. Electric traction now has a new opportunity to demonstrate its value outside of the special fields of suburban, tunnel and heavy grade service.

The use of Diesel-electric locomotives (about 40 per cent an electrical facility) continues to increase, particularly in switching service. This subject is covered in another article in this issue.

The newest entrant in the field of motive power is the steam-electric locomotive built for the Union Pacific by the General Electric Company. Its cost is comparable to the Diesel, it burns the lowest grade of oil at a thermal efficiency of 15 per cent, develops 5,000-



horsepower, is capable of high speeds, can run from 500 to 700 miles without stopping for fuel or water and can hold trains on down grades by means of dynamic braking, which eliminates the problem of overheated wheels. Assuming that the locomotive will deliver test performance under road conditions, it should be an effective competitor to other types of locomotives in main-line service.

Electric Welding and Heating

The largest recent advance in the use of welding in railroad service has been in the field of car construction. This requires both seam and spot welding and it is well backed by the introduction of many improved welders and new and improved types of welding control. The continuous welding of rail is another application which will apparently be greatly extended. The use of closely-controlled electric heat for heat treating of alloy steel parts has lagged behind the use of such steels, but since their success depends upon heat treating, the extended use of electric furnaces can be expected. Electric snow melters are finding new favor and the operator of one yard states that 71 hours' operation will liquidate their first cost.

Electric power used indirectly is effective for the heat-

ing of buildings through the medium of the unit heater—a steam radiator equipped with a fan which transfers the heat rapidly and directs it where it is needed. The same principle is used for winter heating of air-conditioned cars and on some trains having a power car, electric heating units have supplanted the steam coils both for overhead and side-wall heat.

Motors and Control

Several new types of brush-shifting motors, capacitor motors, shell-type motors, splash-proof motors and explosion-proof motors were announced by the manufacturers during the past year. For railroad-applications, the advantageous characteristics included in these are compactness, suitability to built-in design for machine tools, new possibilities for variable-speed operation and safety in grain elevators and coal docks. Reductions in size, as mentioned previously, have in some cases been made possible by the use of fiber-glass insulation.

New types of control equipment introduced during 1938 were to a large extent made to anticipate new machine-tool requirements. They include a. c. contactors, rotating cam switches, oil-proof push-buttons, hazardous-location controls, voltage-regulating controllers, limit switches, flow switches and enclosed switches.

Electrical Measurements

Electrical-measuring instruments have been introduced in considerable number. Further development of the strain gage is perhaps of greatest interest to the railroad industry. By means of this device it is possible to make accurate measurements of forces which cars and locomotives exert on track structures and to measure internal forces on various parts of the vehicle itself. Magnetic and electrical testing of iron and steel parts also offer many unrealized opportunities.

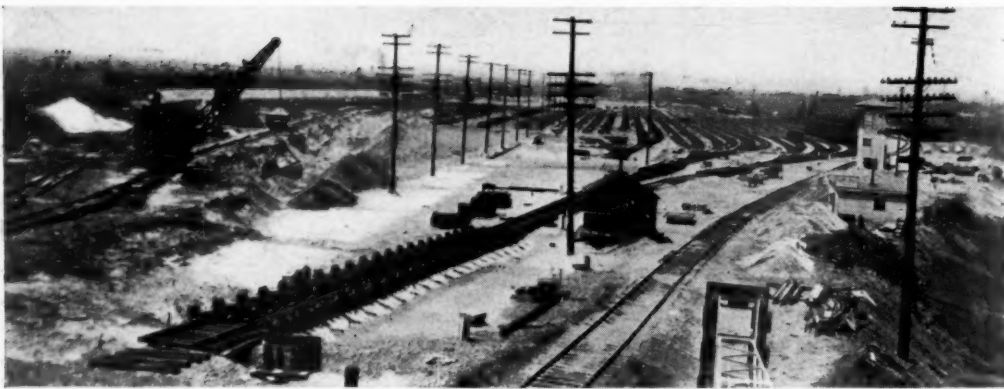
Trucks and Tractors

Storage batteries of increased capacity and of relatively smaller size and industrial trucks and tractors with larger battery compartments have been developed during the past several years. There no longer need be any question about the battery charge lasting through the work period and some trucks and tractors are now operated for 24-hour periods with only one battery charge. In applications requiring much service, the relatively low cost of electric power and simple maintenance requirements make the electric truck a particularly suitable railroad tool.

Power Supply

One of the best measures of progress of the electrical industry as a whole is the electric power output figures. There was a decline in output from 1929 to 1932, but since that time it has risen and in the years 1936, 1937 and 1938 the yearly output exceeded that of 1929 respectively by 19, 30 and 24 per cent. Since October, 1938, the output has risen above that of corresponding weeks in 1937 and has shown a steady rate of increase.

While the use of electrical facilities has increased on the railroads, the cost of electric power has not increased in like amount. Substantial savings have been made by consolidation of power sources, revisions of power contracts and the use of capacitors to reduce line losses and escape paying penalties for low power factor. In one instance on the New York, Chicago & St. Louis, a capacitor installation costing \$1,705 saved \$1,871 in six months.



The Belt Railway of Chicago Has Completely Revised its Clearing Hump Yard

Railway Construction — Still a Pressing Need

IN few other industries is the life of the facilities that must be provided so short as on the railways, not by reason of decay but because of obsolescence. Railway history is one of constant change, for changes in traffic require changes in operating methods and, therefore, in the facilities needed to handle it. For this reason, in normal times, the railways are constantly building new facilities and are expanding, altering or abandoning buildings, tracks, bridges, yards, water stations and other elements of their fixed properties, long before their physical life has expired. As a result, one of the outstanding characteristics of the railway industry has been the magnitude of its construction activities, not only with respect to the number of projects under way at a given time, but with respect to their size as well.

In contrast with these normal activities, railway construction has been practically at a standstill for almost a decade owing to limited revenues and the difficulty of financing the larger projects, as well as to the uncertainty of the future. Yet, during this period operating methods have changed more radically than during any equal period since the railways first came into existence. Many factors have combined to create these changes, including changes that have occurred in industry and in the methods of distributing the products of industry; public demand for better service; new forms of competition in transportation; shortened schedules for both freight and passenger trains; inauguration of pick-up-and-delivery service; and the necessity for greater economy in the face of falling revenues. The net result of these changed operating methods and of the practical suspension of construction is that today the railways are burdened with a greater number of obsolete facilities than at any time in their history.

It has been said that no institution can remain stationary, but that it must either advance or retrograde. It is one of the outstanding accomplishments of railway management that during this difficult decade the railways have not stood still but are giving better service than ever before, despite the handicaps under which they have been compelled to labor. Yet there is a limit beyond which no man or group of men can go toward improving service or even in maintaining it at its present level, if the facilities for doing so continue to become more re-

stricted or out-of-date. In other words, the continued use of these obsolete facilities places an obstacle in the current of traffic and tends to increase the cost of operation unreasonably. Obsolete facilities also prevent the development of new methods designed to expedite the movement of traffic or to reduce the cost of operation, since the newer methods often require facilities entirely different from those in use.

Because of the far-reaching character of the changes that have taken place in operating methods and requirements during the past decade, in shortened schedules, as well as the introduction of new designs for cars and locomotives, no type of railway facility has escaped the blight of obsolescence. For this reason, there exists today an insistent need for additional facilities and for the reconstruction of existing facilities that extends into practically every classification of the fixed property, including revision of alinement, passing sidings, yards, terminals, shops and shop equipment, power plants, storehouses, locomotive-handling facilities, inspection facilities, servicing facilities, fuel and sanding plants, water supply and treating facilities, ash-handling plants, offices, freight houses and other buildings, bridges, signals and numerous other structures and facilities.

Reduction of Curvature

Among the changes in construction requirements that have been brought about by changes in traffic requirements and in operating methods, are those relating to grade reduction and revision of alinement. For many years grade reduction constituted one of the larger and more important items of railway construction. While much of this work remains to be done, under present conditions the day of the old-time drag that could just get over the summit of the ruling grade is gone. In its place are trains of lighter tonnage running on shortened schedules, and revision of alinement to reduce or eliminate curvature is becoming more and more important, for curvature presents a serious obstacle to high-speed passenger-train operation, and those roads that have placed such trains in service are being confronted with the necessity for eliminating curvature that prevents sustained high speed. While necessity has already forced a

certain amount of curve reduction, a large volume of this work is only awaiting more favorable conditions, and the need is increased as the high-speed schedules are extended to new lines or more schedules are added to lines already having this service.

Passing sidings are generally affected by radical changes in operating methods or train schedules. With the advent of centralized traffic control, particularly on single-track lines, such sidings become of paramount importance, for they must be of such length and spacing that trains can meet or pass with minimum delay. They must also be constructed and maintained to a higher standard than formerly to permit speeds far higher than have been necessary heretofore through sidings. They must also be longer than where trains merely get into the clear and wait, for trains must be able to execute the meeting or passing movement without stopping. Incidental to this newer method of train operation, the need for which is as yet far from satisfied, power-operated, remotely-controlled switches and longer turnouts are needed to avoid stopping trains before they enter or leave the sidings, as well as to make higher speeds through the turnouts practicable.

There has been a tendency on the part of a few roads, of late, to abandon some main tracks on multiple-track lines, as well as considerable mileages of yard track and sidings, that have not been needed during the present period of reduced traffic, in order to eliminate the cost of maintaining these facilities. Such steps should be taken only after the most thorough consideration for at the time the slump in traffic occurred, few roads possessed all of either main-track or yard capacity that they needed, and all were engaged actively in constructing additional tracks to facilitate their operations. It seems obvious, therefore, that with a revival in business most of these tracks will again be needed, probably more acutely than before, and that the cost of replacing them will be disproportionately high.

Yards Need Revision

No railway facility feels the effect of obsolescence more quickly or in greater measure than terminal and intermediate switching yards as a result of changes in operating methods. The changes that have occurred during the last decade have created a widespread need for yard construction and reconstruction that cannot be met so long as railway revenues remain at or near their present level. Formerly freight trains passed through and were broken up at every intermediate terminal. This created much delay to traffic as well as unnecessary expense, and to expedite the movement trains are now being made up at the originating terminals or at some convenient point enroute and are then sent to destination without intermediate switching, except to set out and pick up cars at stipulated points. Furthermore, not a few roads are finding it necessary to remove their larger switching operations from metropolitan areas.

Obviously, such radical changes in operating methods cannot be made fully effective without corresponding changes in the facilities for handling trains, so that new yards and the revision of existing yards have become a major need, if traffic is to be handled expeditiously and economically. Little advantage can be gained by expediting the movement of trains between terminals where the time thus gained is more than offset by the delays incident to passing them through yards that were designed for conditions that no longer exist. As an indication of the magnitude of this need for yard construction, so rapidly have the requirements for yard operation changed that yards which represented the last word in design

less than 25 years ago, and relatively few are of later design, are incapable of handling traffic either expeditiously or economically today.

Among the principal needs are the rearrangement of tracks, new or revised humps, the installation of car retarders, interlockings and remotely-controlled switches, yard lighting, communication systems, pneumatic messenger service, and the relocation and rearrangement of office facilities.

Passenger Stations Need Attention

Shrinkage in revenues during the last decade has forced the railways to defer building maintenance and to apply such funds as were available to tracks and bridges, but for a long period prior to 1929 the construction and remodeling of passenger stations had practically ceased, because of declining passenger traffic. For these reasons, despite a revival of passenger business, the railways are compelled to handle passengers through stations that are now obsolete and, in many cases, unfit for the purpose for which they are being used. In plumbing, in heating and in other ways many railway stations are outmoded. While the railways recognize the desirability from a public-relations standpoint of maintaining passenger stations to a high standard, the alternative has been to neglect either these structures or those which affect the movement and safety of trains.

Fuel and Water Stations

No locomotive can operate without a continuous supply of fuel, for which reason fuel stations hold a position in railway operation that is fully realized only by transportation officers, train-service employees and those who are responsible for the maintenance of these facilities. The physical life of most of the coaling stations heretofore installed on the railways is relatively short, by reason of the service they perform, while the constant improvements in design which have characterized them creates obsolescence almost as quickly. While a few locomotive coaling and sanding stations have been constructed during the last decade to replace those no longer able to function, the number is almost negligible when compared with the replacements that should be made.

Water is as necessary in locomotive operation as fuel, while the quality is equally important with the dependability of the supply. Despite the fact that all but a few of the more than 18,000 water stations on the American roads were rebuilt during the two decades prior to 1930, much of this improvement work has since been rendered obsolete by improvements in water-station equipment, by changing methods of handling traffic and by new designs in locomotives. Longer locomotive runs, larger engine tanks and faster schedules are creating a need for the respacing of water stations and at the same time are making heavier demands on many of the stations. New pumping and power units, service tanks of greater capacity and means for faster delivery of the water to locomotives are becoming more and more necessary to meet these increasing demands.

To anyone who is familiar with railway operation, it is obvious that there is at present a highly suppressed demand for an extraordinary volume of railway construction, and that this demand will continue to grow in magnitude and insistence until money becomes available for the vast program that is only awaiting better economic conditions. Fortunately, the outlook for these favorable conditions is better today than at any time since the catastrophe of almost a decade ago.

Work Equipment—

The Need Is Great



Four Men and a Crane Laying 131-Lb. Rail

ALTHOUGH work equipment is a development of the present generation, the use of power machines and tools has expanded to such an extent that today they offer the most important means of effecting economies in maintenance-of-way operations. Originally visualized only as a means of easing the burden of labor, other advantages were given scant consideration at first. Eventually, however, the possibilities inherent in the equipment began to be understood, and during the last ten or fifteen years there has been such a rapid growth in its adaptation for this class of work that today the railways stand committed to its use beyond any possibility of retreat.

How Economies Are Effected

During this latter period many conditions have combined to increase the magnitude of the economies that can be realized through this use. More recently, these potentialities have become still greater by reason of the increases in wages that were granted maintenance-of-way employees a little more than a year ago, as well as by the successful efforts of the train-service brotherhoods to place their members on rail-bound machines as a "make-work" measure.

Except for such types of work equipment as are used primarily to perform work that cannot be done by hand, as steel bridge erection and the handling of other heavy materials, economy is the most important consideration in the purchase and use of work equipment. Obviously, these economies are effected by the replacement of men, but their magnitude varies with the wage scale as well as with the shortening of the time in which the work can be accomplished. For this reason, as wages advance, the economy of employing work equipment will also increase and the higher the wage scale the greater is the incentive to substitute machines for men. Since the advance in wages that was made late in 1937 amounted to

about 15 per cent, it added proportionately to the savings effected by the equipment already in use.

In general, where hand labor is still employed, the economy of substituting power machines will be still greater proportionately, for in most cases they also shorten the time required to do the work. This then brings to the fore some machines that could not be justified heretofore on the grounds of economy, and adds greatly to the incentive for further development and expansion in the use of power machines and tools for maintenance-of-way work.

Another development of recent origin which has a direct bearing on the economy of work equipment, is the movement sponsored by the train-service brotherhoods, to place members of their crafts on many classes of work equipment operating on main tracks, which have heretofore been given the needed flag protection by the gangs using them. This campaign of the brotherhoods grew out of the reduction in employment during the depression, from which train-service employees suffered in common with those in other branches of railway service. As a result of this campaign, the Board of Adjustment has issued numerous orders requiring that conductors and enginemen be placed on units of equipment when working on main tracks, which cannot be readily removed from the track.

Off-Track Equipment Becoming Attractive

That these decisions have not added to the economy of operating railbound units of work equipment is manifest, for rarely do these train-service men displace any of the men already employed, or perform any work that has not been done previously by the regular maintenance forces. In other words, so far as the operation and protection of the equipment is concerned, they are superfluous and add disproportionately to the cost of its operation because of the disparity in the wages they receive compared with those of the maintenance-of-way forces. In all cases this reduces the economy of the equipment, and in some cases eliminates it, thus providing a strong incentive to accelerate the trend which has been noticeable for several years of replacing rail-bound machines with off-track equipment, which not only has a wider range of action, but is free of those restrictions which add so greatly to the cost of operating it.

As is true of other developments which require radical changes in established practices, work equipment made its way slowly at first, so that its wider use is relatively recent in maintenance-of-way activities. In fact, it is less than 28 years since the first roadmaster's district was fully equipped with motor cars, this being between Elgin, Ill., and Savanna, on the Omaha line of the Chicago, Milwaukee, St. Paul & Pacific. Yet, for more than a decade the motor car has been accepted almost universally as a standard unit of equipment for maintenance gangs and today more than 50,000 are in service.

As was true at that time with other forms of work equipment, the primary objective of using motor cars

was to ease the burden of labor; that is, to eliminate the laborious task of pumping hand cars, often against head winds and ascending grades. This relief was so great that it is doubtful whether gang organizations could be maintained today if it became necessary to return to the hand car. It was quickly found, however, that there were other advantages, in that the men reached the work in a shorter time, they were fresh upon arrival and the mobility of the forces was greatly increased.

Work Equipment Demonstrates Many Advantages

Experience with other equipment has been similar. The tie tamper has not only reduced the drudgery of an unwelcome task, but produces more uniform work of greater permanence at less cost than hand work. Likewise, the tie adzer conserves time, does more accurate work, reduces the hazard of personal injury and conserves the life of ties. Four or five men with a rail crane will lay more rail than 25 men can by hand and with greater safety. Spike pullers, spike drivers, bolt tighteners, power drills and other machines and tools are demonstrating the same characteristics of economy, speed and safety, that are so essential today in maintenance-of-way work.

Other types of work equipment are giving similar results in the bridge and building field. The paint spray, the power saw, the wood borer, the power trench pump, the air compressor and the electric generator have brought attractive results in economy and safety. An officer of one of the larger roads said recently that without the aid of these types of work equipment he would have been unable to maintain his bridges to the desired standard during the last few years.

Much Equipment Obsolete

It should not be lost sight of that much of the equipment in use today is obsolete, either by reason of age or because the conditions for which it was purchased no longer exist. The motor car is a good illustration of this situation. Originally designed for 6 and 8-men, or larger, gangs, during the last few years section gangs have been so reduced in size that they can no longer handle the heavy cars of 10 years ago with safety or without excessive effort, and these cars should be replaced with lighter cars. Other equipment, such as the steam shovel, which is as efficient today as in former years, has also become obsolete because it has been outmoded by lighter, quicker-acting and more mobile earth-moving machines, such as power shovels, draglines and tractors, which are powered with internal-combustion engines, and which are more economical in operation.

Maintenance-of-way work has always been character-

ized by changing requirements, but today these changes are occurring more rapidly than ever before, to meet the needs of changing traffic. This is particularly true of the refinements that are demanded with respect to line and surface to insure the smooth-riding track that is essential to the operation of the high-speed passenger trains that are meeting with so much popular favor. Track which will meet this requirement and at the same time withstand the destructive effect of heavy freight trains moving at passenger-train speeds, can be put up only with mechanical equipment. Furthermore, much of this work is so laborious that men are unwilling to undergo the drudgery connected with it. All of these conditions point to the necessity for an adequate complement of modern power equipment, designed to meet these needs of today's traffic.

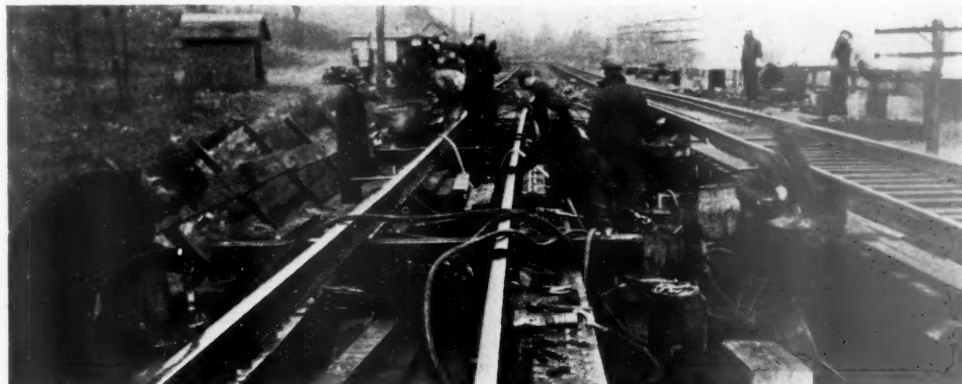
Investment Must Be Increased

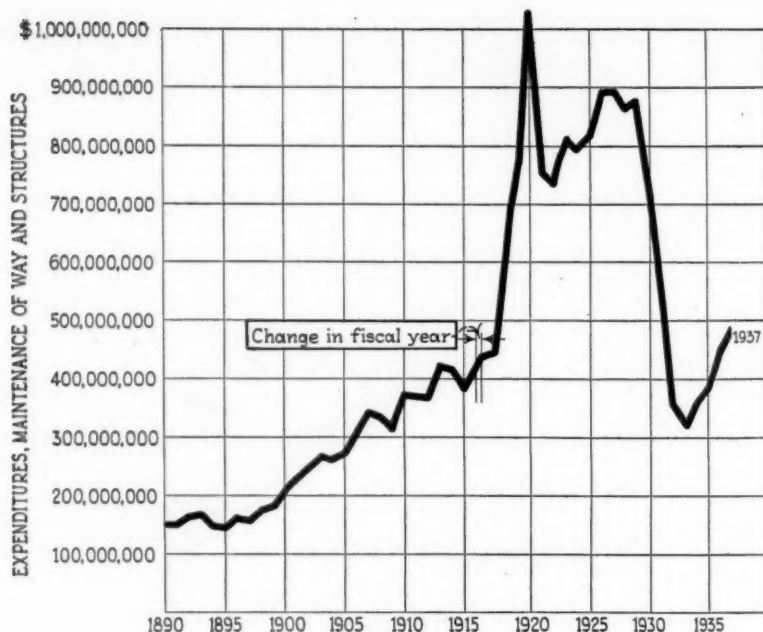
Although the railways already have an investment in work equipment that is estimated to exceed \$100,000,000, no road has all that it needs and many of them are still more inadequately supplied. Railway officers recognize also that much of the equipment they now own is outmoded and that only by replacing these worn out and obsolete units with others of modern design can they realize the economies they are striving to attain. They are also aware that they stand in need of additional units for, although they have purchased to the limit of their ability during the last three years, these purchases have been entirely inadequate for their needs.

Spurred on by increased earnings early in 1937, the roads purchased more than 3,300 units of new equipment during that year, involving a total outlay of more than \$5,000,000. With the sharp decline in traffic in the latter part of 1937 and the continued low level of earnings during 1938, it might have been expected that the market for this equipment would be closed. Yet, as an indication of the exceptional need for power machines and tools, more than 1,200 units were purchased during 1938, when expenditures were being watched more closely than at any time during the depression.

Railway officers have come to appreciate, more today than ever before, the economies they can effect through the use of work equipment. They are aware that the changing conditions that are confronting them are intensifying this need. The purchases they have made during these difficult years, while wholly inadequate, demonstrate their determination to buy to the limit of their resources. What they can do is limited by their earnings. With the increased earnings that are forecast for the coming year, their expenditures for work equipment will increase and the economies they can effect will grow in proportion to their purchases.

Small Power Tools Have Demonstrated a High Degree of Economy in Bridge Work





Expenditures for Maintenance of Way and Structures, Class I Railways—1890 to 1937

How Much Behind in Maintenance?

EXPENDITURES for maintenance of way and structures made by the Class I railways of the United States (excluding switching and terminal companies) during the five-year period ending with 1929 averaged \$849,020,923. In the eight-year period from 1931 to 1938 inclusive, the annual expenditures averaged only \$415,000,000. In other words, during the last eight years the railways have spent less than 50 per cent as much annually to maintain their fixed properties as they spent annually during the earlier period.

How Far Behind Are We?

Superficially these figures indicate a much greater accumulation of deferred maintenance than actually exists, for it is well recognized that the requirements for the upkeep of the fixed properties are influenced greatly by

the volume of traffic. On the basis of gross ton-miles, the traffic during the eight years, 1931 to 1938 inclusive, has averaged about 29 per cent less than it did from 1925 to 1929 inclusive. In considering the difference in maintenance of way expenditures during the two periods, this reduction in traffic must be taken into account in accordance with the commonly accepted criterion that about 33 per cent of these expenditures are affected by use. Furthermore, during the former period, construction was very active and large sums were charged into the maintenance of way accounts in connection with the revision of facilities, while during the latter period construction has been relatively inactive, with a corresponding reduction in these incidental charges to maintenance.

Weight must also be given to the marked advances that have been made in the efficiency with which work

Expenditures for Maintenance of Way and Structures, Class I Railways

	Average 1925-1929 (Inclusive)	1930	1931	1932	1933	1934	1935	1936	1937
Superintendence	\$57,262	\$57,198	\$49,324	\$36,552	\$31,921	\$33,347	\$35,605	\$37,357	\$39,780
Roadway Maintenance	83,698	64,794	48,575	32,042	30,026	30,714	35,809	38,289	42,017
Tunnels	2,608	2,087	1,774	1,466	933	1,051	1,453	1,326	1,709
Bridges, Culverts, etc.	43,471	37,612	28,123	19,434	17,627	20,139	22,646	24,032	26,237
Ties	114,859	91,224	72,651	50,294	43,543	50,748	51,936	56,315	54,799
Rails	47,402	34,639	25,960	13,762	14,324	15,418	16,302	21,192	19,138
Other Track Materials	48,354	36,296	26,505	15,726	15,362	18,694	20,959	26,732	30,228
Ballast	19,379	13,262	8,601	4,969	5,814	7,538	8,357	11,992	12,362
Track Laying and Surfacing ..	211,067	172,136	131,274	83,407	77,025	85,641	94,033	106,072	121,113
Fences and Snow Sheds	5,831	4,494	3,119	2,135	2,047	2,412	2,260	†3,397	†3,689
Crossings and Signs	13,115	12,632	9,656	6,468	5,969	7,293	7,186	*	*
Buildings	79,000	63,836	42,539	24,924	24,576	31,448	33,047	41,252	27,982
Water Supply	10,444	8,944	6,299	3,952	3,749	4,441	4,497	5,860	6,182
Tools and Equipment	18,230	16,534	11,834	7,917	8,051	10,666	11,044	13,452	15,407
Injuries	5,907	5,424	3,941	2,811	2,417	2,810	2,727	3,118	3,303
Removing Snow, Ice and Sand ..	9,947	7,713	4,343	4,699	4,188	5,630	7,001	13,365	6,655
Miscellaneous	78,449	65,432	56,095	40,621	34,714	37,310	39,105	51,059	44,642
Total	\$849,021	\$705,471	\$530,613	\$351,179	\$322,286	\$365,300	\$393,967	\$454,810	\$486,223

NOTE: Miscellaneous includes signals and interlocking, all charges for depreciation and unclassified items.

* Not shown separately in 1936 or 1937.

† Includes, signs, as well as fences and snow sheds.

is being performed, compared with the earlier period. Better materials and stronger track construction are also resulting in greater economies. Preservative treatment is extending the life of ties, thus reducing the number of renewals; heavier rails, improved joint fastenings and larger tie plates also tend to prolong tie life; while larger rail sections, the heat treatment of rail ends and the reconditioning of rail ends by welding have increased the intervals between the successive renewals of rail. In addition, the wider use of power machines and tools has resulted in large economies in the labor cost of maintenance work.

Certain maintenance activities can be neglected without inherent damage to the property or a large cumulative effect on expenses—cutting weeds outside the road-bed, dressing the ballast and the policing of station grounds being examples—although there may be a considerable increase in the charges for these items for the first year or two after these activities are resumed. On the other hand, such work as the repair and painting of bridges, buildings and other structures, cannot be neglected without incurring appreciable depreciation and subsequent large increases in maintenance expenses.

More Than a Billion

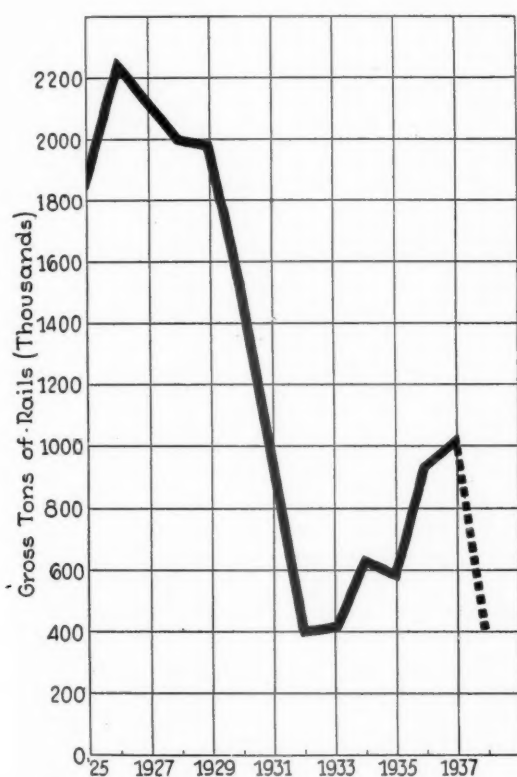
By reason of the wide variety of work embraced in the maintenance of the fixed property, as well as the differences in the effect of neglecting the several items, it is obvious that any attempt at a statistical determination of the extent of deferred maintenance leads into devious ramifications. This effort is further complicated by the fact that in recent years expenditures have not been well balanced; that is, more has been spent proportionately on some elements of the property than on others. Yet such an analysis, when taking into account all of the more tangible elements and making generous deductions for those that are more or less intangible, leads to the conclusion that there is an accrued deficiency

in maintenance of more than a billion dollars, or more than twice the expenditures made by the Class I roads in any year since 1930.

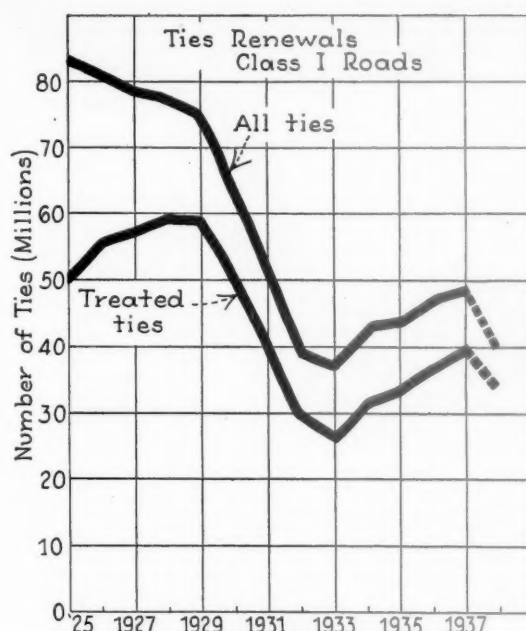
Some measure of the extent to which this aggregate deficiency is distributed among the various elements of the fixed property is afforded by the table giving the breakdown of maintenance expenditures between 1930 and 1937, inclusive, compared with the corresponding average figures from 1925 to 1929 inclusive. While quantitative determination of the accrued deficiency in expenditures for individual items presents practical difficulties, it is obvious that the deficiencies in all items are large.

Rail and Ties

Two major items, ties and rail, lend themselves to such an analysis. Measured in tons, the rail laid by the Class I roads from 1925 to 1938 inclusive, was as shown in the table. It is scarcely debatable that the wear on rail is in direct ratio to the tonnage passing over it. Yet, owing to the practices that have been developed to prolong the life of rail, the relationship between traffic and renewals has not remained constant. Just how much



Rails Laid in Replacement by Class I Railways



Crossties Inserted in Existing Tracks by Class I Railways

Rail Applied in Renewal—Class I Roads

	Gross Tons		Gross Tons
1925	1,950,146	1932	394,536
1926	2,209,873	1933	403,254
1927	2,124,765	1934	631,093
1928	2,080,277	1935	582,794
1929	1,958,489	1936	921,298
1930	1,517,002	1937	1,029,861
1931	984,900	1938	400,000*

* Estimated

these conservation methods have affected new rail requirements since 1929 is indeterminable, but study indicates that the accrued deficiency is now more than 3,000,000 tons.

Likewise, between 1925 and 1929, inclusive, the Class I roads inserted an average of 78,770,446 ties in renewal annually. In subsequent years there was a marked decline in tie renewals, reaching the low level of 37,295,716 crossties in 1933, and increasing to 47,729,538 in

1937. In 1938, slightly less than 40,000,000 ties were used in renewal.

Crossties fail by reason of mechanical destruction from traffic, and decay. Better protection against the former and a wider use of preservative treatment to retard decay

Crossties Applied in Renewals—Class I Roads

1925	82,716,674	1932	39,190,473
1926	80,745,509	1933	37,295,716
1927	78,340,182	1934	43,306,205
1928	77,370,491	1935	44,351,900
1929	74,679,375	1936	47,361,015
1930	63,353,828	1937	47,729,538
1931	51,501,659	1938	40,000,000*

* Estimated

have reduced the requirements for replacements. Yet, after taking the increased use of treated ties and the reduced wear from traffic into account there is an indicated deficiency of approximately 60,000,000 ties at the end of 1938.

Effect of Higher Speeds

Any discussion of deferred maintenance is incomplete unless consideration is given to the marked increase that has taken place in the speed of both passenger and freight trains during this period when maintenance activities have been curtailed so drastically. The smooth performance of these fast trains is evidence of the high quality of the line and surface that has been maintained on the tracks over which they operate. Yet in the light of the limited expenditures by individual roads and the roads as a whole, the conclusion is inescapable that increasing proportions of the funds available for track maintenance are being spent on these high-speed tracks.

Faced with the necessity for retrenchment, maintenance of way officers have been compelled to defer work that did not reduce the effectiveness or safety of

their properties, to the end that the maximum allotments could be made to items of upkeep that were of a more vital nature. The normal distribution of the maintenance dollar was modified in such a way as to permit more money to be spent on tie renewals and surfacing, and less on other track materials and ballast.

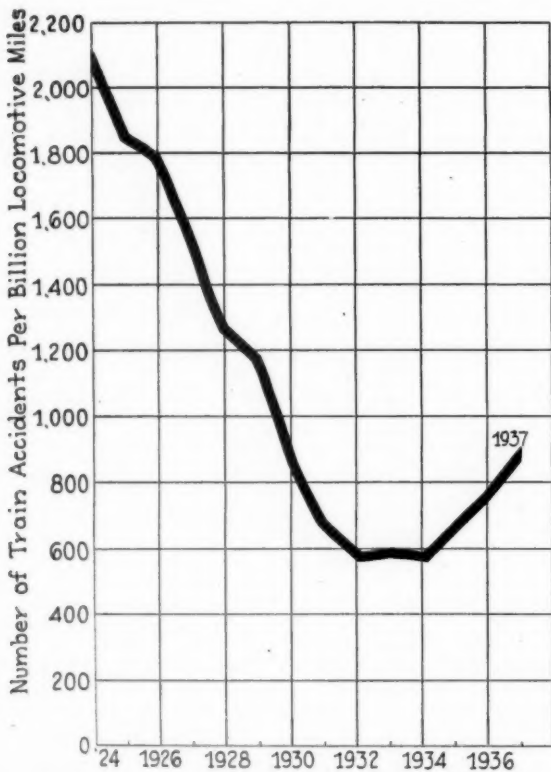
Has Safety Been Affected?

Although it is admitted freely on all sides that there is an urgent need for greater expenditures for all items of maintenance and for an expanded program of replacements, as well as for much larger expenditure for the repair of those elements of the property that do not affect the safety or effectiveness of operation, it has been contended that the tracks and bridges are in excellent condition so far as safety is concerned. It has often been said also that sufficient reserve was built into the tracks and bridges during the period immediately preceding the crash of 1929 to carry over a long period of restricted appropriations. This statement is not disputed, for it is obvious that if this reserve had not been available during the lean years the roads would be in a much more unfortunate position than they now are. It cannot be ignored, however, that much of this fat has been consumed, and the question arises whether this sanguine attitude is now justified. The railways have enjoyed an enviable reputation for safety in their operation, especially because of the marked reduction in accidents during the last two decades. But has this downward trend continued unbroken during the present decade? Since the answer to this question may shed considerable light on the subject of deferred maintenance, it is well to investigate the record so far as it relates to train accidents ascribed to defects in or inadequate maintenance of the way and structure.

Other things being equal, train accidents vary with the volume of traffic, which for the purpose of analysis may be expressed in terms of locomotive-miles. On this basis, the number of train accidents ascribed to defects in track declined from 2,090 per billion locomotive-miles in 1924 to 1,175 in 1929, and continued the downward trend to an average of 581 for the three years 1932 to 1934, but from that point they increased steadily to 760 in 1936, while in 1937 they rose still further to 845. That this upward trend is not the result of some peculiar non-recurring condition is evidenced by the fact that they were well distributed through all of the major classifications.

It may be that the corresponding data for 1938, which are not yet available, may show a reversal of this trend. Be that as it may, the facts that have been given offer adequate support for the conclusion that the railways are far behind in the upkeep of their tracks and structures. That they will greatly expand their programs for maintenance of way as earnings increase is self evident.

With the increase in traffic that is in prospect, it is certain that appropriations for maintenance of way and structures will be more liberal, for managing officers are fully aware of the importance that attaches to making up deferred maintenance, in the interest of economy if for no other reason. Even with enlarged appropriations and more extended programs of maintenance, however, the elimination of these deferred items will be spread over several years. In fact, it is desirable that the rehabilitation that must be accomplished be done in this way rather than all at one time, for an orderly schedule of regular sequence, while increasing maintenance activities to a marked degree, will not disrupt the established organization or create confusion in maintenance practices.



Train Accidents Per Billion Locomotive Miles Ascribed to Defects in Track or to Improper Maintenance

A Review of Railway Operations in 1938

Results disappointing—Upturn near year-end—Operating efficiency and safety record excellent

By Dr. Julius H. Parmelee,

Director, Bureau of Railway Economics

RAILWAY operations in 1938 proved even more disappointing as to financial results than had been anticipated. Some improvement toward the close of the year saved the final net deficit from falling below that of the low depression year 1932, but even so the carriers suffered a large deficit after fixed charges.

Freight rates on some commodities were increased moderately as a result of the decision of the Interstate Commerce Commission in Ex Parte 123, while passenger coach fares in Eastern District were increased half a cent, from 2 to 2½ cents per mile. Material prices showed some declines. Wages remained at the levels to which they were raised in 1937 as the result of the increases of that year, despite the efforts of the carriers in 1938 to effectuate a general reduction of 15 per cent in standard rates of pay. Railways continued to maintain a high level of operating efficiency.

The outstanding event of the year, outside of financial and operating results, was preparation of the report of a joint committee of three railway executives and three railway labor leaders. The President of the United States set up this committee in September, with a broad assignment to survey the transportation problem with recommendations, and the committee handed him its report on December 23. (This report was reviewed in detail in the *Railway Age* of December 31, and the prospects of its enactment into law are discussed in an article elsewhere in this issue.)

Other Proposals for Aid to Railroads

Before Congress adjourned in June, and at the time when railway financial returns were at lowest ebb, considerable activity was devoted in Washington to developing aid for the hard-pressed rail industry. The carriers in February failed as a whole to earn their operating expenses and taxes, an almost unprecedented situation. A reduction in wage rates was under consideration, and railway employment was at a very low point.

The President in March called conferences of three members of the Interstate Commerce Commission, legislative and administration leaders, representatives of the railways and of railway labor, and others. He requested the three Commission members, Chairman Splawn and Messrs. Eastman and Mahaffie, to submit a report on the railroad situation with recommendations. This they did in a document that came to be known as the Splawn Report. That report, together with comments from other members of the conference and from President Pelley of the Association of American Railroads, was forwarded to Congress on April 11, as part of a special presidential message entitled "Immediate Relief for Rail-

roads". While the President called attention to the gravity of the railway situation and the need for action, he made no specific recommendations, although he expressed his opposition to railway subsidies and to government ownership. The message received wide attention, but did not result in Congressional action.

The Splawn Report discussed means of immediate relief, and also suggested a long-term program. Under the head of immediate relief, the report made the following recommendations, among others, in which all other available members of the Commission concurred.

1. That approximately \$300,000,000 be made available from government loan funds for purchase of railroad equipment.
2. That for 12 months the Reconstruction Finance Corporation be empowered to make loans without certification by the Interstate Commerce Commission that the railroad can meet its fixed charges.
3. That other forms of government credit be considered from the point of view of public policy.
4. That government traffic pay the full rate by eliminating land-grant reductions.
5. That consideration be given to the establishment of a single court in charge of railroad reorganizations.

The long-term program was accompanied by a partially concurring opinion submitted by Chairman Splawn, who expressed certain views as to reorganization of the Interstate Commerce Commission. In addition to certain suggested changes in existing legislation, the program had the following principal points.

1. That a Federal Transportation Authority be created for two years, to plan and promote action by railroad companies to eliminate waste, aid consolidation and coordination.
2. That the Authority investigate the economy and fitness of all types of transportation, and the extent of government aid to each.
3. Emphasis on the desirability of subjecting all important forms of transportation to equal and impartial regulation by a single government agency.

Many other recommendations and suggestions were developed during the year. The most definite unofficial attempt to outline a program was that sponsored by various groups, in a series of conferences at the Chamber of Commerce of the United States in Washington in September and November.

Wage Developments

In the summer and fall of 1937 the carriers, after protracted negotiations, settled with representatives of rail-

way labor their demands for increased rates of pay. Non-transportation forces were increased 5 cents per hour, effective August 1, 1937, and the transportation group 44 cents per basic day or its equivalent in miles, effective October 1, 1937. Almost immediately following these increases business fell off rapidly, until in February, 1938, railroad net earnings had declined to a point lower than at the lowest period in 1932 or 1933.

Reduced earnings coupled with increased operating costs created a serious financial situation for the carriers. The decision of the Interstate Commerce Commission of March 8, in Ex Parte 123, apparently shut off hope of securing added revenues through further rate adjustments. General business was on the decline, and the volume of both freight and passenger traffic was shrinking.

Representatives of the carriers, meeting in Chicago on April 29, decided to institute a general wage reduction of 15 per cent, to become effective July 1. Employee organizations were immediately notified to that effect.

This move was met with prompt refusal by labor to accept any reduction in wage scales, and by a threat to strike. Then followed a series of negotiations between representatives of management and labor in an effort to reach a settlement. Early in August it became apparent that settlement of the controversy by means of direct negotiation was impossible. Consequently the carriers invoked the services of the National Mediation Board. Commencing on August 11, that board conducted a series of conferences, but without result. The carriers then indicated their willingness to submit the matter to arbitration, but labor rejected the proposal.

In pursuance of the powers conferred on him by the Railroad Labor Act, President Roosevelt on September 27 appointed a three-man fact-finding board, to conduct hearings and report its recommendations in respect to the issues involved. Hearings began on September 30 and were concluded on October 17.

The report of the board, made public on October 29, recommended against a wage reduction. The recommendation was based on the board's findings that (a) railroad wages were not high compared with wages in comparable industries, (b) the proposed reduction would not meet the financial emergency of the industry, (c) the carriers' situation was a "short-term" one, which might readily change, and (d) a reduction would run counter to the trend of wages in industry generally.

Deferring to the recommendations of the board, the carriers met in Chicago on November 4, agreed to abandon the proposal for a wage cut, and so notified the President.

Railway wage rates are subject to the minimum wage provisions of the Fair Labor Standards Act of 1938, commonly called the Wage-Hour Act. Approved by the President in June, 1938, this act became effective on October 24. The act is designed to put a floor under wages per hour, and a ceiling over hours per week.

The act exempts railway employees from the maximum-hours provision, which is section 7 of the act, but makes them subject to the minimum-wage provision, which is section 6. That section provides that during the first year 25 cents or its equivalent shall be the minimum hourly wage for employees subject to the act. During the next six years, the minimum is increased to 30 cents per hour. After the end of the seventh year, the minimum shall be 40 cents per hour, unless the administrator of the act and his industry committee decide to the contrary. On the other hand, the committee for any particular industry may, under the provisions of section 8 of the act, put in a minimum hourly rate of 40 cents prior to the close of the seven-year period if, after investiga-

tion and hearings, such action is found to be in the public interest. The industry committee may not act without the approval of the administrator, but he is not empowered to make an order at variance with the recommendation of an industry committee. No committee has yet been appointed for the railway industry.

Certain other sections of the act are of interest to the railways, such as section 15 prohibiting the transportation of goods produced in violation of the wages and hours provisions, certain regulations dealing with maintenance of wage and hour records, and the like.

While it is not known how many changes in minimum wage rates took effect in the railway industry on October 24, as a result of the wage provisions of the act, the number was probably not large. However, many interpretations will be necessary, to make clear what groups of railway employees are or are not subject to the act, which applies only to employees actually engaged in interstate commerce.

Railroad Unemployment Insurance

Congress enacted in 1938 a companion measure to the Railroad Retirement Act of 1937. This measure sets up a separate national system of unemployment compensation for rail employees, effective July 1, 1939, to be administered by the Railroad Retirement Board.

The act was sponsored by railway labor organizations, and was opposed by the railways and the United States Treasury Department. Railway opposition centered not on the principle of unemployment compensation, but on the policy of separating railway employees from the system of unemployment compensation already in effect under the provisions of the Social Security Act and complementary state laws. The carriers also opposed a number of specific provisions of the act, but were unable to secure the cooperation of railway labor in modifying them. Railway managements believe that the unemployment benefits provided by the act are so much more liberal than those of the federal-state systems now in effect that the three per cent payroll tax levied by its provisions on employers, will not prove adequate. No tax is levied on the employee.

The act removes railway employees from the coverage of the Social Security Act and complementary state laws, and transfers them to the railway unemployment insurance system. If an employee in his "base year" has earned as much as \$150 in aggregate wages, and becomes unemployed, he is entitled to unemployment benefits payable at the rate of 16 days per month over a maximum period of about five months. His benefits are proportioned to his total earnings in his base year, according to the following scale:

Total Earnings	Daily Benefit	Maximum Annual Benefit
\$150 — \$199.99	\$1.75	\$140
200 — 474.99	2.00	160
475 — 749.99	2.25	180
750 — 1,024.99	2.50	200
1,025 — 1,299.99	2.75	220
1,300 — and over	3.00	240

Railroad Retirement

The year 1938 marked the first year in which railroad retirement under federal statute was completely operative.

As of November 30, 1938, a total of 121,748 persons were on the rolls of the Railroad Retirement Board at an aggregate monthly amount of \$7,595,263, or \$91,143,000 per year.

The Railroad Retirement Board distinguishes between persons retired under the provisions of the Railroad Retirement Act, and those transferred from carriers'

voluntary rolls, by reference to the former as "annuitants" and to the latter as "pensioners". As of November 30, there were 75,274 regular annuitants on the rolls of the Board, whose average monthly annuity amounted to \$66.15; in addition, 3,381 annuitants receiving partial or temporary compensation pending adjudication of claims, and 822 survivor or death-benefit annuitants. Pensioners numbered 42,271, at a monthly average of \$58.25.

The following summary indicates the grand total of expenditures to November 30, 1938, and the status of the Railroad Retirement Account as of that date.

Railroad Retirement Account	
Appropriation by Congress	\$264,750,000
Interest on investments	1,410,822
<hr/>	
Benefit payments	266,160,822
	122,275,895
Balance to be accounted for	\$143,884,927
<hr/>	
Assets	
Investments (3 per cent special Treasury notes)	\$74,200,000
Unexpended balance	69,684,927
	<hr/>
	\$143,884,927

Actual tax collections to November 30, which tend to lag behind the appropriations, amounted to \$203,728,000. Administrative expenses of the board, which are not included in the benefit account but are provided by specific appropriations, have amounted in total to \$5,570,000.

Other Legislative Activities

A number of bills were enacted by Congress in 1938, in which rail carriers had a direct or collateral interest, while several similar bills did not pass.

The act creating a Civil Aeronautics Authority withdrew certain regulative powers over air carriers from the Interstate Commerce Commission, and vested them in the new Authority. That body has limited powers as to rates, none as to issuance of securities, but controls the extension or abandonment of operations, consolidations, mergers, etc. In addition, it is entrusted with the function of promoting air transport through research, investigation, and in other ways.

Congress amended the revenue acts, making some changes in the excess profits and other taxes; the general bankruptcy act; the motor carrier act in certain particulars recommended by the Interstate Commerce Commission.

For one reason or another, certain other bills did not pass. A bill to limit freight train lengths to 70 cars was the subject of extensive hearings before the House Committee on Interstate and Foreign Commerce, which voted against reporting out the measure. The Pettengill bill to repeal the long-and-short-haul clause, which had passed the House in 1937, was favorably reported by the Senate Committee on Interstate Commerce, but did not come to a vote. Additional bills that failed of passage proposed to establish a six-hour day for train dispatchers, to eliminate certain land-grant rates, and to liberalize the making of railroad loans by the Reconstruction Finance Corporation.

Traffic and Revenue Trends

Carloadings showed a decrease under 1937 during each of the first 45 weeks of the year 1938, and an increase in each of the final seven weeks of the year. In considering this trend, and other related trends, we must keep in mind the fact that rail traffic and earnings were inclined sharply downward in the final quarter of 1937.

Nevertheless, the moderate relative improvement experienced during the latter weeks of 1938 gave some promise of continued improvement in 1939, which is supported by the forecast of the thirteen Shippers' Advisory Boards that carloadings in the first quarter of 1939 will exceed those of the first quarter of 1938 by about 10 per cent.

Taking the first six months of 1938 as a unit, and the third and fourth quarters separately, the relative decreases from the corresponding periods of 1937 were as indicated below.

	Carloadings (Decrease)	Operating Revenues (Decrease)
First six months	25.3%	21.6%
Third quarter	21.7	13.8
Fourth quarter	2.9	1.6

The smaller decrease in revenue than in carloadings is principally due to rate increases that become effective in 1938, the details of which are outlined at a later point. A downward trend in the percentage of decrease in carloadings and revenues, such as the foregoing table shows for 1938, may be considered a hopeful indication.

Chart A shows the monthly trend in railway operating revenues in 1937 and 1938. It clearly outlines the wide

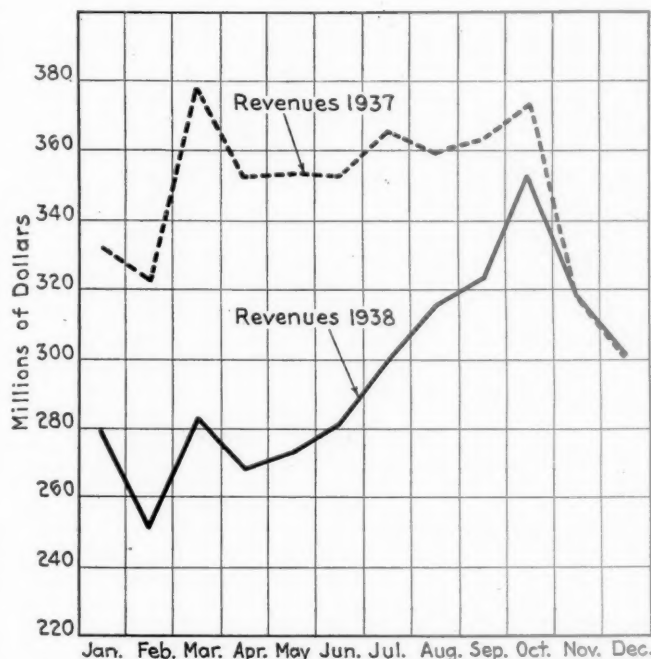


Chart A—Monthly Trend in Railway Revenues, 1937 and 1938

spread that existed between the two years, from January to July, with a narrowing of the spread to the end of the year. The returns for 1938 were below those of 1937 in practically every month.

Railway Taxes

Railway tax accruals in 1938 amounted to \$345,000,000, compared with \$325,665,000 in 1937, an increase of 5.9 per cent. This increase does not accurately represent the situation, due to certain credits in 1937 offsetting charges previously made on account of the Railroad Retirement Act of 1935, which were cancelled under the provisions of the Carrier Taxing Act of 1937.

The rate of tax on payrolls for unemployment compensation under the Social Security Act increased from 2 per cent in 1937 to 3 per cent in 1938. The 2¾ per cent tax on carrier payrolls imposed by the Carriers

Taxing Act of 1937, effective January 1 of that year, remained the same in 1938. This will increase to 3 per cent on January 1, 1940.

The total net charge to tax accruals in 1937 on account of railroad retirement (after the credits previously described) was \$25,290,000. The gross amount accrued before such credits, however, was \$52,834,000. Charges on account of unemployment compensation, in 1937, amounted to \$39,585,000. The gross sum of the two taxes was \$92,419,000.

The tax on account of railroad retirement approximated \$47,000,000 in 1938, while the tax for unemployment compensation was about \$52,500,000, a total payroll tax of approximately \$99,500,000, or \$7,081,000 greater than the total payroll tax of 1937. Although the payroll tax rate in 1938 was more than one-fifth greater than in 1937, the aggregate increase in taxes was lessened by reason of reduced employment in 1938.

Employees also pay a tax of $2\frac{3}{4}$ per cent toward railroad retirement; their contribution is not included in the foregoing totals.

Railway taxes other than payroll taxes declined, due to the reduction in accruals of gross revenue and income taxes occasioned by the greatly reduced earnings of 1938.

Rates and Fares

The proposal of the carriers to increase freight rates (with some exceptions) by 15 per cent was pending before the Interstate Commerce Commission on January 1, 1938. This the Commission had docketed as Ex Parte No. 123. The Commission's report, dated March 8, declined to authorize any increases on some commodities, authorized five per cent on some, and 10 per cent on others, the increases to be measured from the basic rates in effect prior to the decision in Ex Parte 115. The average net increase authorized in the Ex Parte 123 decision was calculated at about 5 per cent, and became effective at the end of March. Based on 1938 traffic, the increase is estimated at \$150,000,000 per year.

Previously, in Ex Parte 115, the Interstate Commerce Commission had authorized a charge of 3 to 15 cents per ton on bituminous coal, the amount of the charge being scaled to the base rate. At the same time, the Commission attached an expiration date, namely, December 31, 1938. The carriers petitioned for removal of this expiration date, and after hearings in October the Commission granted the petition. With a few slight exceptions, these charges will continue until further action is had regarding them. This will preserve freight revenue to the amount of approximately \$20,000,000 per year.

Eastern carriers requested the Commission to reconsider its earlier refusal (in April, 1938) to authorize an increase of half a cent in the basic coach fare in their district, from 2 to $2\frac{1}{2}$ cents per mile. Hearings on this request were held in June, and in July the Commission granted it for a period of 18 months, the increased rates going into effect on July 25. The adverse report in April was made by a close vote of 6 to 5; the favorable report in July was rendered by a vote of 10 to 1.

Carriers in the Southeast decided in December to reduce their basic coach fare from two to $1\frac{1}{2}$ cents per mile, effective as soon in January, 1939, as tariffs can be filed and made effective.

An increase of five per cent in Pullman fares, other than upper berths, became effective August 1. The Pullman Company had asked authority to increase its rates 10 per cent.

No decision was announced by the Commission on the

pending application of the Railway Express Agency for authority to increase express rates. It was estimated that the proposal would yield increased revenue of about 10 million dollars.

The Field of Competition

While exact statistics are not available, indications are that competition in the transportation field continues to grow in intensity.

According to the American Trucking Associations, the index number of truck loadings during the first eleven months of 1938 was 96.25 (1936 being taken as 100), compared with 110.32 in the corresponding period of 1937. This was a decrease of about 13 per cent, whereas railway carloadings on the same basis of comparison showed a decrease of more than 20 per cent.

Tonnage through the Panama Canal showed a small decrease in the fiscal year 1938, compared with 1937, but the decrease was nothing like the decrease in railway tonnage in the same period.

By contrast to rail, truck, and water traffic decreases, passenger traffic by air continued to increase in 1938. The Department of Commerce reports increases (first nine months) of about 14 per cent in plane-miles and more than 17 per cent in number of air passengers carried.

The Bureau of Motor Carriers of the Interstate Commerce Commission continued in 1938 to clean up problems growing out of the "grandfather" clause of the Motor Carrier Act of 1935. It devoted its efforts also to the confused rate problem in the motor carrier industry, to safety efforts, and to enforcement and administrative questions. Educational work was also undertaken by means of conferences in the freight field and contacts with leaders in the industry, in order that the meaning of the act and its many requirements might be more completely appreciated.

The Bureau has on record some 48,000 motor carriers, of which 44,500 are truck operators and 3,500 are bus operators. Two-thirds of the total number, or 32,000, are classified as common carriers and the remaining 16,000 as contract carriers. The Bureau has issued 200,000 tags for individual motor trucks and buses subject to its registration requirements.

Material and Supply Costs

Trends in the unit cost of material and supplies purchased and utilized or consumed by railways can be measured by the price index developed by the Bureau of Railway Economics. This index stood at 138.3 in December, 1937 (the average for May, 1933, being 100) and averaged 134.0 in December, 1938. Thus there was a price decline of 3.1 per cent during 1938. Even with this recession, the unit price of railway material and supplies was one-third greater in December, 1938, than it was in May, 1933. Price index numbers for various dates since May, 1933, are as follows:

	Material and Supplies (other than fuel)	Fuel (Coal and Oil)	Total
May, 1933	100.0	100.0	100.0
December, 1935	118.5	127.7	121.6
April, 1937	143.2	144.6	143.7
December, 1937	136.7	141.5	138.3
December, 1938*	131.1	139.8	134.0

* Preliminary

These indexes are computed on the basis of actual unit prices, weighted in proportion to purchases made during the calendar year 1936.

The average unit price of material and supplies (other than fuel) increased 43.2 per cent from May, 1933, to

April, 1933. Since April, 1937, there has been a relative decline of 8.4 per cent.

The average cost of coal (excluding direct freight and handling charges) increased from \$1.51 per ton in May, 1933, to \$2.07 per ton in April, 1937. The average cost in December, 1938, was approximately \$2.02 per ton. Fuel oil prices increased from 56 cents per barrel in May, 1933, to 98 cents in April, 1937, and stood at about 88 cents per barrel in December, 1938. The two principal fuel items, coal and oil, showed an average increase in price of 44.6 per cent from May, 1933, to April, 1937. From that date to the end of 1938, they declined 3.3 per cent.

Railway Financing

As of November 30, 1938, the status of railway financing through government agencies was as outlined below:

Total loans (RFC and PWA)	\$814,400,239
Repaid by railways	238,745,146
Balance, November 30	\$575,655,093
Of which there has been sold to the public at a net profit of \$4,702,563	106,497,000
Still held by government	\$469,158,093

Indebtedness of the carriers to the government increased from \$406,016,096 at the close of 1937 to \$469,158,093 on November 30, 1938, a net increase of \$63,142,000.

The carriers repaid a total of \$13,157,503 during the first eleven months of 1938, which is included in the total repayment of \$238,745,146 shown above.

By executive order, the President in October, 1937, directed the Reconstruction Finance Corporation to make no further commitments for loans or other advances to railway companies. On February 18, 1938, however, again by executive order of the President, resumption of loans to railways was authorized. New borrowings by the railways during the first eleven months of 1938 totaled \$76,299,500.

The Railroad Credit Corporation continued liquidation of its original loan fund of about \$75,000,000. As of November 30, 1938, \$56,971,440 or 77½ per cent had been liquidated, by pro rata distribution among participant carriers.

Receiverships and Trusteeships

At the beginning of 1938, a total of 109 railway companies were in the hands of receivers or trustees, of which 36 were companies of Class I. The operated mileage of the 109 companies totaled 70,884 miles.

Two Class I companies went into trusteeship and one Class I company into receivership, during the year. Several small companies went into the hands of the courts, and several came out of receivership, making a net total of 111 companies operating 78,016 miles, in the hands of the courts at the close of 1938.

This mileage, representing 31 per cent of the total railway mileage in the United States, is the greatest mileage ever in the hands of the courts at any one time, whether measured by number of miles or by proportion of total mileage so situated.

Eleven (14,194 miles) of the 39 railway companies of Class I included in the total of 111 companies are in equity receivership, while the remaining 28 companies (61,102 miles) are in process of reorganization under Section 77 of the Federal Bankruptcy Act.

These 39 companies combined operate 32 per cent of the total mileage operated by all railways of Class I.

Other relative factors indicative of the seriousness and extent of this situation are as follows:

39 Class I Railways

	Amount	Per cent of All Class I Railways
Investment in road and equipment	\$5,471,797,147	27.1
Capital stock	2,123,173,328	26.1
Unmatured and matured funded debt	3,494,424,310	32.8
Stock plus ununmatured and matured funded debt	5,617,597,638	29.9
Total operating revenues	918,061,556	22.0
Number of employees	266,944	23.9

Proceedings before the Interstate Commerce Commission looking toward reorganization of debtor companies under the provisions of Section 77 of the Bankruptcy Act made progress in 1938.

Final reports on plans of reorganization were issued for four Class I carriers, and were certified to the respective courts of jurisdiction. Proposed reports on plans of reorganization were issued for six Class I carriers, while one plan was denied approval. An interim report was released as to another Class I company.

All plans proposed or approved during the year provided a combined debt reduction of more than fifty per cent.

Principal Operating Factors

Financial results of operation for the year 1938 were worse than in any year since the World War, except for 1932. The following summary compares the statistical results of railway operation in 1938 with the corresponding results for 1937 and 1930. A more detailed analysis of the several factors will follow. All the statistics in this and succeeding statements relate to railways of Class I, and all are subject to revision when the audited reports of the carriers become available for 1938.

1. Freight traffic (ton-miles) declined 19.6 per cent under 1937, and was 24.4 per cent below 1930.

2. Passenger traffic (passenger-miles) declined 11.6 per cent under 1937, and was 18.7 per cent below 1930.

3. Operating revenues decreased 14.8 per cent under 1937, and were 32.8 per cent under 1930.

4. Total operating costs, including expenses, taxes, equipment and joint facility rentals, amounted to \$3,188,000,000 in 1938, compared with \$3,576,000,000 in 1937, a decrease of 10.9 per cent.

5. Net railway operating income amounted to only \$362,000,000 in 1938, a decrease of 38.6 per cent under 1937, and less than in 1930 by 58.3 per cent.

6. The carriers failed to earn their fixed charges in 1938 by \$125,000,000. They had a net income after fixed charges in 1937 of \$98,000,000, and earned a net income in 1930 of \$524,000,000.

7. Had it not been for the rate increase authorized by the Interstate Commerce Commission in late 1937 and in March, 1938, the carriers would have had the largest deficit in their history.

Chart B outlines the six factors appearing in the foregoing summary on an index basis, the comparative figures for 1930 being taken in each case as 100 per cent. Results for the year 1932 are included in the chart, so as to afford a direct comparison between that year and 1938.

Comparing 1938 with 1930, total operating revenues were two-thirds as great in 1938, total operating costs were three-fourths as great, while net railway operating income was only two-fifths as great. Net income after fixed charges disappeared completely in 1938. Revenue ton-miles were three-fourths as great, and revenue passenger-miles four-fifths as great.

The decline in operating revenues in 1938 compared

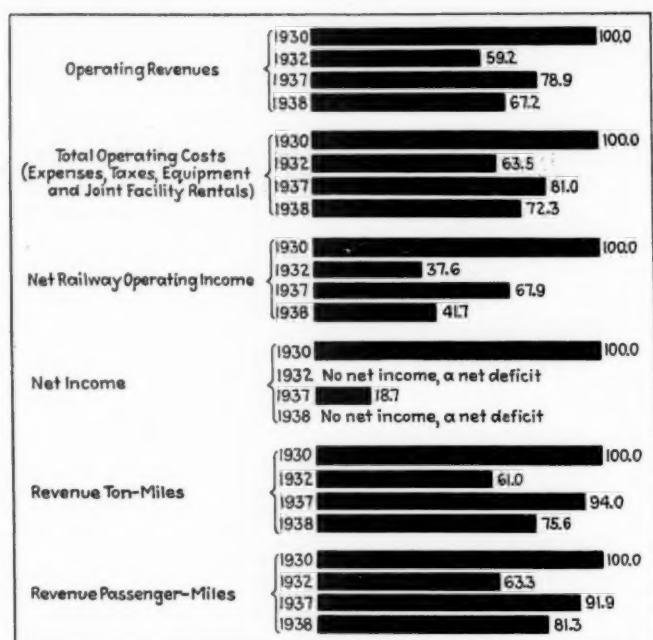


Chart B—Comparative Results for Years 1930, 1932, 1937 and 1938 (1930 = 100)

with 1930 was greater than the decline in freight and passenger traffic, principally due to the decrease in average revenue per traffic unit. Rising unit operating costs and taxes prevented the carriers from reducing costs in the same ratio as revenues declined, with the result that although there was a decline in operating revenues from 1930 to 1938 of one-third, the reduction in net railway operating income was approximately three-fifths.

Comparing 1938 with 1932, the lowest depression year, total operating revenues and total operating costs in 1938 each increased about 14 per cent. Net railway operating income increased about 10 per cent, while the net deficit after fixed charges was less by about \$14,000,000, or 10 per cent. Revenue ton-miles were up about 24 per cent, and passenger-miles about 28 per cent. In other words, with considerably greater traffic in 1938 than in 1932, financial returns were only slightly better.

Traffic in 1938

Revenue carloadings in 1938 were less than in 1937 by 7,250,000 cars, or 19.2 per cent. They were less than in any year since records have been tabulated, except only 1932 and 1933.

Carloadings, which began an upward trend in August, 1935, continued to increase almost uninterruptedly throughout the year 1936, and through the first nine months of 1937. Commencing with the week ended October 15, 1937, and continuing through the first forty-five weeks of 1938 to the week ended November 19, loadings showed a consistent decline under the respective weeks of the next preceding year. Only during the last seven weeks of 1938 did weekly loadings exceed prior-year loadings.

The peak loading of the year occurred during the week of October 15, with 725,612 cars, compared with a peak of 843,861 cars in 1937. Weekly loadings exceeded 700,000 cars in only the four last weeks in October.

Table I summarizes railway freight and passenger traffic in each of the years 1930 to 1938.

Carloadings in 1938 were 19.2 per cent less than those

of 1937, while ton-miles were 19.6 per cent less. Passenger-miles fell off 11.6 per cent.

Revenue ton-miles in 1938, except for the years 1932

Table I—Comparative Traffic Statistics

Revenue Carloadings (Thousands)	
1938	30,425
1937	37,675
1936	36,109
1935	31,504
1934	30,846
1933	29,220
1932	28,180
1931	37,151
1930	45,878

Revenue Ton-Miles (Millions)	
1938	290,000
1937	360,620
1936	339,246
1935	282,037
1934	268,711
1933	249,223
1932	233,977
1931	309,225
1930	383,450

Revenue Passenger-Miles (Millions)	
1938	21,800
1937	24,655
1936	22,421
1935	18,476
1934	18,033
1933	16,341
1932	16,971
1931	21,894
1930	26,815

to 1935, were less than in any other year since 1915. Revenue passenger-miles in 1938, although greater than in the four years 1932 to 1935, were less than in any other preceding year since 1903.

Chart C shows the monthly trend of carloadings for the years 1938 and 1937, and by way of further comparison, for 1932 and 1930. The curves on the chart are index numbers developed by the Federal Reserve Board, based upon the averages of 1923-1925 as 100 and adjusted for seasonal variations. The low level of freight traffic during the first nine months of 1938, when it ran

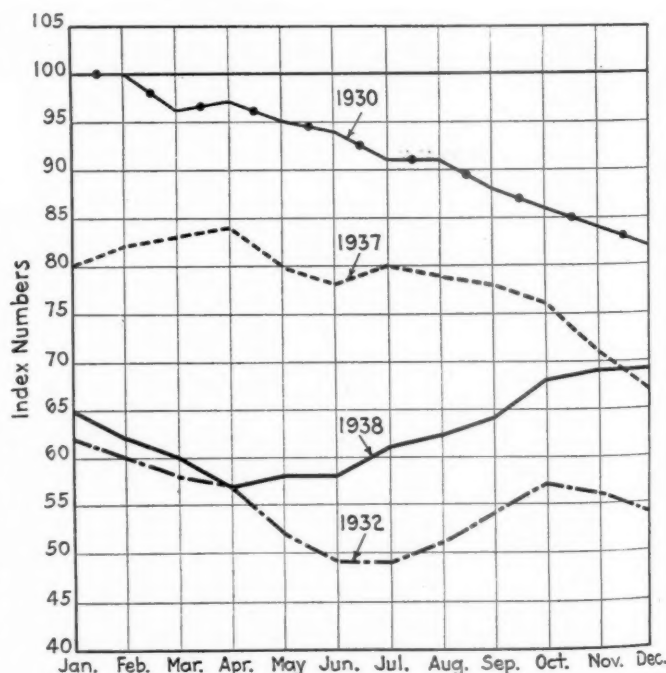


Chart C—Freight-Car Loadings
Index of Freight-Car Loadings by Months—1930, 1932, 1937 and 1938
(1923-1925 = 100—Monthly figures adjusted for seasonal variation)
(Source: Federal Reserve Bulletin)

at or below 65, is manifest, with a slight upward trend to about 69 in December. The average yearly index, which was 92 in 1930, stood at 78 in 1937, and declined further to 63 in 1938.

Loadings by Commodity Groups

Table II distributes the 30,425,000 cars loaded in 1938 among the eight principal commodity groups, according to the classification of the Car Service Division, Association of American Railroads. The percentage decrease in each group, 1938 under 1937, will be found in the second column of the table.

Seven of the eight commodity groups decreased in 1938, the percentage of decrease ranging from a maxi-

Table II—Distribution of Carloadings

Commodity	Number (000)	Per cent Decrease		Per cent distribution	
		1938	1937	1938	1937
Grain and products ...	1,975	Inc. 10.3		6.5	4.8
Live stock	703	2.6		2.3	1.9
Coal	5,510	21.0		18.1	18.5
Coke	272	46.4		0.9	1.3
Forest products	1,414	22.7		4.6	4.8
Ore	844	61.8		2.8	5.9
Merchandise, l. c. i.	7,694	9.1		25.3	22.5
Miscellaneous	12,013	20.9		39.5	40.3
Total	30,425	19.2		100.0	100.0

mum of 61.8 per cent for ore down to a minimum of 2.6 per cent for live stock. Grain and grain products showed an increase. Loadings of live stock and merchandise in 1938 were the lowest for any year of record.

Financial Results in 1938

Condensed results of operation in 1938, shown in Tables III to VI, are summarized from available monthly reports; the returns for earlier years are drawn from annual reports.

Table III is a condensed income account of railways of Class I for the years 1938, 1937, and 1930. The year 1930 is included in this and succeeding tables, to supply a more nearly normal basis of comparison than that offered by any intervening year since 1930.

Operating revenues and expenses declined sharply in 1938, while taxes showed an increase. Total operating revenues in 1938 decreased \$616,000,000, or 14.8 per cent, while operating expenses declined \$409,000,000, or 13.1 per cent.

The operating ratio stood at 74.4 per cent in 1930,

Table III—Income Account

	1938 (Millions)	1937 (Millions)	1930 (Millions)
Total operating revenues	\$3,550	\$4,166	\$5,281
Total operating expenses	2,710	3,119	3,931
Taxes	345	326	349
Net railway operating income	362	590	869
Net income after fixed charges ... Def. 125		98	524

compared with 74.9 per cent in 1937 and 76.3 per cent in 1938. Although the operating ratio increased in 1938, it would have been even greater but for a slightly higher level of rates and marked reductions in maintenance expenses.

Net railway operating income in 1938 amounted to \$362,000,000, a decrease of 38.6 per cent under 1937, and less by 58.3 per cent than in 1930. The amount of net railway operating income earned in 1938 was not sufficient to meet the fixed charges of the year. There was a net deficit after fixed charges amounting to \$125,000,000 in 1938, compared with a net income of \$98,

000,000 in 1937, and a net income of \$524,000,000 in 1930.

Operating Revenues

All classes of operating revenue showed declines in 1938 under 1937, and all were considerably less than in 1930. Table IV compares the principal items of railway revenue in 1938, 1937, and 1930.

Table IV—Operating Revenues

	1938 (Millions)	1937 (Millions)	1930 (Millions)
Freight revenue	\$2,845	\$3,378	\$4,083
Passenger revenue	405	443	730
Mail revenue	96	98	111
Express revenue	48	57	115
All other	156	190	242
Total	\$3,550	\$4,166	\$5,281

Freight revenue, representing 80 per cent of total operating revenues, declined 15.8 per cent under 1937, and was 30.3 per cent less than in 1930. Passenger revenue showed a decline in 1938 of 8.6 per cent under 1937, and was 44.5 per cent less than in 1930.

Express revenue, which represents contract payments to Class I carriers from the railway express companies, showed a decrease of 15.8 per cent. Gross charges for express transportation decreased $3\frac{1}{2}$ per cent. Effective August 1, 1938, the Railway Express Agency, Inc., took over operations of the Southeastern Express Co., so that one express agency, instead of two, is now handling the express activities of the rail industry.

Operating Expenses

As in the case of operating revenues, every class of operating expenses was reduced in 1938. Table V compares the principal items of operating expenses in 1938, 1937, and 1930.

Table V—Operating Expenses

	1938 (Millions)	1937 (Millions)	1930 (Millions)
Maintenance of way	\$425	\$496	\$706
Maintenance of equipment	668	827	1,019
Traffic	103	105	128
Transportation	1,352	1,510	1,848
General and other	162	181	230
Total	\$2,710	\$3,119	\$3,931

Transportation expenses decreased \$158,000,000, or 10.5 per cent, 1938 under 1937.

Maintenance-of-way expense was reduced by \$71,000,000, or 14.3 per cent, while maintenance-of-equipment decreased \$159,000,000, or 19.2 per cent. The two maintenance accounts combined amounted to \$1,093,000,000 in 1938, which was a decrease of \$230,000,000, or 17.4 per cent, under 1937. Compared with 1930, total maintenance expenses in 1938 were less by \$632,000,000, or 36.6 per cent.

Total maintenance expenses averaged about 31 per cent of railway operating revenues. This average remains quite constant over the years. As business declines, so do maintenance expenditures and as railway operating revenues increase so does maintenance, in almost direct ratio. However, there was a particularly heavy curtailment in maintenance in 1938, due to the low earnings basis on which the carriers were operating, and to the necessity of reducing all expenditures to the minimum level consistent with operating safety.

Had maintenance work been less severely curtailed in

1938, the net financial returns for the year would have been even more meager than they were. The effect on maintenance employees is indicated by the fact that the average number of that group during the first eleven months of 1938 decreased under the corresponding period of 1937 by 123,972, or 22.5 per cent, while all other groups of railway employees declined in number by 62,298, or 10.8 per cent.

Unserviceable locomotives and freight cars decreased during the year 1937, but increased during the year 1938. As to freight locomotives, the ratio of unserviceable to total averaged 30.5 per cent in 1936, stood at 25.5 per cent in 1937, and increased to 29.1 per cent in 1938. The ratio of unserviceable to total passenger locomotives was 23.3 per cent in 1936, 20.2 per cent in 1937, and increased to 23.3 per cent in 1938. The ratio of unserviceable to total freight cars on line averaged 12.8 per cent in 1936, and was 10.1 per cent during 1937; it also increased to 11.8 per cent during 1938. The improvement in these factors during 1937 was lost in the financial exigencies of 1938.

Net Railway Operating Income and Rate of Return

The rate of return declined in 1938 to 1.39 per cent. This rate is computed on book investment in railway property used in transportation service, including cash, material and supplies. Table VI shows for a period of ten years, 1929 to 1938, the total amount of net railway operating income and the rate of return on property investment in each year.

Table VI—Net Railway Operating Income and Rate of Return

Year	Net Ry. op. inc. (000)	Rate of return per cent	Year	Net Ry. op. inc. (000)	Rate of return per cent
1938.....	\$362,000	1.39	1933.....	\$ 474,296	1.82
1937.....	590,204	2.26	1932.....	326,298	1.24
1936.....	667,347	2.57	1931.....	525,628	1.99
1935.....	499,819	1.93	1930.....	868,879	3.28
1934.....	462,652	1.78	1929.....	1,251,698	4.81

The rate of return on investment in 1938 was 1.39 per cent, compared with 2.26 per cent in 1937, and 3.28 per cent in 1930. The corresponding rates of return for the three districts were as follows: Eastern District, 1.55 per cent in 1938, compared with 2.73 per cent in 1937; Southern Region, 1.81 per cent in 1938, compared with 2.35 per cent in 1937; Western District, 1.08 per cent in 1938, compared with 1.71 per cent in 1937. The greatest relative decrease in rate of return occurred in the East, followed in turn by the West and the South.

In its report in the bituminous coal rate case in November (229 I.C.C. 451), the Interstate Commerce Commission found a value for the transportation properties of railways of Class I, as of January 1, 1938. This value it set at \$19,882,000,000. On the basis of such a valuation aggregate, the carriers earned a rate of return of 1.82 per cent in 1938.

Revenue Per Traffic Unit

The average revenue received by the railways for handling a ton of freight one mile increased to 0.982 cents in 1938, compared with an average of 0.935 cents in 1937. The increase resulted from increased rates authorized by the Interstate Commerce Commission in 1937 and 1938.

Revenue per passenger-mile averaged 1.880 cents in 1938, compared with 1.794 cents in 1937. This increase resulted in part from the increase in maximum passenger

fares for coach travelers in Eastern District, effective July 25, 1938.

Table VII shows these averages for the years 1921, 1925, and 1930 to 1938.

Table VII—Revenues per Ton-Mile and Passenger-Mile

Year	Revenue per ton-mile (cents)	Revenue per passenger-mile (cents)
1938.....	0.982	1.880
1937.....	0.935	1.794
1936.....	0.974	1.838
1935.....	0.988	1.935
1934.....	0.978	1.918
1933.....	0.999	2.013
1932.....	1.046	2.219
1931.....	1.051	2.513
1930.....	1.063	2.717
1925.....	1.097	2.938
1921.....	1.275	3.086

During the sixteen-year period from 1921 to 1938, revenue per ton-mile declined by 23.0 per cent, while revenue per passenger-mile declined 39.1 per cent.

The increase in freight rates authorized by the Commission, Ex Parte 123, became effective on March 28, 1938, and was not fully reflected in the returns of the year 1938 as a whole. Revenue per ton-mile for the period subsequent to March, 1938, averaged about one cent, which was approximately the level of 1933.

Capital Expenditures and Purchases

Table VIII shows the amounts spent by railways of Class I for capital improvements, and for the purchase of materials and supplies, during the past ten years, 1929 to 1938. The entries for 1938 are only approximations.

Capital expenditures for the eight years 1923 to 1930 averaged \$842,715,000 per year, and for the eight years 1931 to 1938 averaged \$261,606,000.

Purchases of material and supplies during the eight-

Table VIII—Capital Expenditures and Purchases

Year	Capital expenditures	Purchases of materials and supplies
1938 (estimated)	\$ 250,000,000	\$ 600,000,000
1937.....	509,793,000	966,383,000
1936.....	298,991,000	803,421,000
1935.....	188,302,000	593,025,000
1934.....	212,712,000	600,224,000
1933.....	103,947,000	465,850,000
1932.....	167,194,000	445,000,000
1931.....	361,912,000	695,000,000
1930.....	872,608,000	1,038,500,000
1929.....	853,721,000	1,329,535,000
Total—ten years	\$3,819,180,000	\$7,536,938,000

year period 1923 to 1930 averaged \$1,383,517,000, and for the period 1931 to 1938 averaged \$646,113,000 per year.

Expenditures for capital improvement and for purchases of material and supplies in 1938 were necessarily curtailed, on account of the low level of railway earnings. Additions to rail equipment were correspondingly reduced.

Locomotive and car installations in 1938 were below those of 1937, while the number of units on order on December 1, 1938 was considerably less than the number on order on the last day of 1937.

According to the Car Service Division, Association of American Railroads, 265 steam, electric and Diesel-electric locomotives, and 14,947 freight cars were installed during the first eleven months of 1938. The freight car statistics include those of railroad-owned private controlled refrigerator companies. These totals

compare with 450 locomotives and 75,058 freight cars installed during the whole of the year 1937.

Equipment on order as of December 1, 1938, was also much below the levels of December 31, 1937. Table IX shows statistics as to locomotives and freight car installations and number of units on order in 1930 and each of the five years from 1934 to 1938.

Statistics as to passenger car installations and orders are not now currently reported.

Units of equipment owned showed further declines in 1938. Compared with the 57,571 locomotives owned on December 31, 1929, the number owned on November 1,

was 49.5 per cent. Table X shows the averages for 1922 and 1930 and the trend from 1932 to 1938.

Table X—Average Speed of Freight Trains

Year	Miles per hour
1938 (10 months)	16.6
1937	16.1
1936	15.8
1935	16.0
1934	15.9
1933	15.7
1932	15.5
1930	13.8
1922	11.1

Table IX—Equipment Installations
(Railroad Owned or Controlled Units)

	Installed during year	On order December 31
Steam locomotives (new):		
1938 (11 months and Dec. 1).....	162	17
1937	373	131
1936	87	297
1935	40	5
1934	59	7
1930	782	120
Electric and Diesel locomotives (new):		
1938 (11 months and Dec. 1).....	103	39
1937	77	30
1936	34	7
1935	102	3
1934	31	90
Freight cars (new):		
1938 (11 months and Dec. 1).....	14,947	4,335
1937	75,058	7,947
1936	43,941	25,592
1935	8,903	12,805
1934	24,103	628
1930	76,909	9,821

1938 of 44,282 were less by 13,289 locomotives, or 23.1 per cent. However, the new locomotives installed since 1929 have been of a larger tractive power. For example, new locomotives installed during 1937 and 1938 had an average tractive power of more than twice the average of all the 1929 locomotives in service.

As to freight cars, the number owned on December 31, 1929, totaled 2,277,505, while on November 1, 1938 the freight car ownership was reported as 1,706,726 cars. As in the case of locomotives, the capacity of freight cars has increased.

Improvement in operating efficiency has enabled the carriers to handle a given amount of traffic with a lesser number of units of equipment, with the result that no serious car shortages have occurred.

The number of stored serviceable locomotives totaled 3,311 on November 1, 1938. To protect the service, a total of 2,600 stored serviceable locomotives is normally necessary.

During the year 1938 the maximum serviceable freight car surplus was 329,023 cars and the minimum was 139,436 cars, not taking into account privately owned or special cars. Normally, the carriers should have a serviceable freight car surplus of about 80,000 units.

With an excess number of serviceable equipment units stored, and with a greater than normal number of units of equipment in bad-order, the carriers now have a potential margin of equipment capacity, over recent peak requirements, of perhaps as much as thirty per cent.

Freight Train and Car Movement

Average speed of freight trains, including all stops between terminals, again increased in 1938 to a new high level. This average was 16.6 miles per hour in 1938 (10 months) as compared with 16.1 miles per hour in 1937, a previous record. The increase from 1922 to 1938

A freight train maintaining an average speed of 16.6 miles per hour, for a continuous period of 24 hours, would cover a total of 398 miles.

During the first ten months of 1938, the average movement per "active" freight car per day (excluding surplus and unserviceable units from the calculation) was 38.9 miles, compared with 40.6 miles in 1937.

The average movement per "active" freight locomotive (excluding stored and unserviceable units from the calculation) was 98.7 miles per day during the first 10 months of 1938, and 104.5 miles in 1937. Corresponding averages for "active" passenger locomotives were 178.1 miles per day in 1938, compared with 177.0 miles in 1937.

Generally speaking, freight and passenger operating efficiency has steadily improved from 1921 to 1938. Although traffic trends in 1938 were downward, the carriers operated their properties with high efficiency.

Economy in use of fuel in the freight service again surpassed all records. Freight locomotive fuel consumption per 1,000 gross ton-miles averaged 113 pounds during the first 10 months of 1938, compared with 117 pounds in 1937, and with 163 pounds in 1922.

The average train load was 756 tons during the first ten months of 1938, compared with an average of 796 tons during 1937. Ton-miles per freight car-mile (tons per car) decreased in 1938 under 1937, the average for 1938 (10 months) being 26.0 tons and 27.1 tons for the year 1937.

Net ton-miles per serviceable freight car day averaged 513 ton-miles during the first 10 months of 1938, compared with 625 ton-miles during the year 1937.

Gross ton-miles per freight train-hour again broke all records in 1938. The average for 1930, and for each of the years 1934 to 1938 will be found in Table XI.

Table XI
Gross Ton-Miles per Freight Train-Hour

1938 (10 months)	31,085
1937	30,349
1936	29,200
1935	28,674
1934	28,040
1930	25,837

Net ton-miles per freight train-hour averaged 12,433 during the first 10 months of 1938, slightly below the record of 12,695 ton-miles established in 1937.

In the passenger service, the speed of locomotive-propelled trains in 1938 averaged 36.2 miles per hour between terminals, compared with 36.0 miles in 1937; the average speed of rail motor-car trains was 27.3 miles per hour between terminals in 1938, compared with 27.1 miles in 1937. The over-all average speed of all passenger trains was 34.6 miles per hour in 1938, compared with 34.5 miles in 1937 and 34.0 miles in 1936.

Motive power fuel consumption per passenger train car-mile averaged 14.7 pounds during the first 10 months

of 1938, compared with 15.1 pounds during 1937, and 17.9 pounds during the year 1922.

Safety of Railway Operations in 1938

Total number of fatalities in railway accidents of all kinds during the first nine months of 1938 declined to 3,326 compared with 4,043 for the same period of 1937. This was a reduction of 17.7 per cent. Non-fatal injuries declined by 28.8 per cent. Total casualties, fatal and non-fatal, declined 27.4 per cent, compared with a decrease of only 16.4 per cent in total locomotive-miles.

Employee safety also showed improvement during 1938. The number of fatalities decreased from 507 in the first three quarters of 1937 to 358 in the same period of 1938, a decline of 29.4 per cent. Nonfatal injuries fell from 18,461 to 11,801, or by 36.1 per cent. Man-hours on duty were less by only 19.7 per cent, resulting in an improvement in the fatality frequency rate of 11.9 per cent and in the nonfatal frequency rate of 20.4 per cent.

During the first 9 months of 1938, there were 754 fewer grade crossing accidents than in the corresponding period of 1937, resulting in 296 fewer fatalities and 806 fewer nonfatal injuries. These were declines of 24.4 per cent in the number of accidents, 22.7 per cent in the number of fatalities, and 22.9 per cent in the number of nonfatal injuries, which compare with a decline of only 16.4 per cent in total locomotive-miles.

Two passenger train accidents marred the otherwise excellent safety record of the railroads in 1938. One of these accidents occurred when a passenger train crashed through a bridge unexpectedly weakened by flood conditions. The second resulted from the negligence of an employee in throwing a switch in the face of an oncoming passenger train which collided head-on with another passenger train.

Railway Employees—and a Look at 1939

The number of railway employees during 1938 averaged 940,000, the lowest average level of rail employment since 1897. Railway personnel during 1937 averaged 1,114,663 employees. Railway employees in 1938 were less than in 1937 by 175,000, or 15.7 per cent.

Total compensation paid employees amounted to \$1,737,000,000 in 1938, compared with a total of \$1,985,447,000 in 1937.

Annual earnings of employees averaged \$1,847 in 1938 and \$1,781 in 1937. Compensation per hour paid for

The decrease in railway employees was made necessary by the low level of railway traffic and revenues. As already indicated in a preceding section, the number of maintenance employees decreased at more than twice the rate of all other employees.

Two questions face the railways of the United States, and the transportation industry generally, as they enter the new year. First, what will be the level of industrial activity in 1939? Second, will the comprehensive program submitted to the President on December 23 be carried into effect?

Much will depend on the answers to these questions, as the months of the year 1939 disclose the events of that year. Predictions are freely made that after a momentary pause during the first quarter, industrial activity will show a gradually rising curve, bringing the year 1939 as a whole above the levels of either 1936 or 1937. If these forecasts are realized, rail carriers will benefit, although they have a long distance to go before they reattain a satisfactory basis of financial return.

As already indicated, the fate of the Joint Committee's program will depend largely on development of a united and cooperative effort to translate its recommendations into legislative and administrative policy.

Unfortunately, the threat of war still hangs over the world, and may cast lengthening shadows over the events of 1939. It will lead to renewed emphasis on preparations for national defense, in which the railways will undoubtedly have a share. Further, the success or failure of efforts of the nations of Europe and Asia to avoid war will largely determine the course of events, both industrial and political, in those continents, and on the Western Hemisphere as well.

Railroads and National Defense

(Continued from page 13)

of a kind which will send management into a war without an efficient plant to run.

During the World War, after a brief period of letting management run the plant, the government found it necessary to take over; and to grant a subsidy in the form of the guaranteed return. This proved quite expensive; and an obvious alternative would seem to be a little foresight in the adoption of policies which will permit the railroads to earn an adequate living—coupled with some immediate financial aid to give them a good start along such a course. Indeed, many are now taking the position that some form of temporary railroad subsidy may be necessary. Among them is Harry A. Wheeler, president of the Railway Business Association, who suggests that such a grant would in reality be "only a price paid for an option or call upon a properly maintained property of proved national value or necessity." But whatever the form of the financial aid which they favor, all those thinking about the problem are in virtual agreement with Mr. Wheeler's warning that "any plan for national defense which does not include the most far-reaching preparedness of the railroads is inconceivably weak."

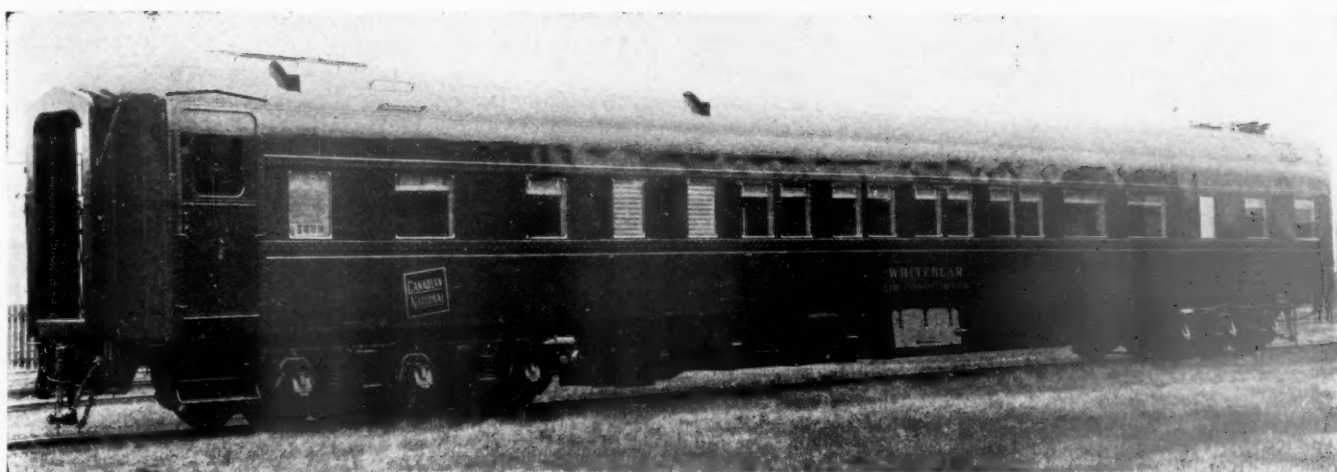
Recalling again then the foregoing hypothesis that "preparedness of the railroads" need mean no more than keeping them in shape to anticipate the country's normal commercial transport demands, it nevertheless remains the stubborn fact that any effective mobilization plan must recognize that needed railroad rehabilitation work is still a mighty big job to which the national-defense program should bring the "do-it-now" urge.

Table XII—Employees and Their Compensation

Year	Average number of employees	Total compensation	Average compensation per employee
1938	940,000	\$1,737,000,000	\$1,847
1937	1,114,663	1,985,446,718	1,781
1936	1,065,624	1,848,635,804	1,735
1935	994,371	1,643,878,510	1,653
1934	1,007,702	1,519,351,725	1,508
1933	971,196	1,403,840,833	1,445
1932	1,031,703	1,512,816,147	1,466
1931	1,258,719	2,094,994,379	1,664
1930	1,487,839	2,550,788,519	1,714

averaged 74.9 cents in 1938, compared with 70.9 cents in 1937. Increased average earnings of employees resulted partially from the wage increases of August 1 and October 1, 1937, and were partly due to a change in the relative proportions of employment classes.

Table XII shows, for railroads of Class I in the United States, the average number of employees, aggregate and average compensation for each year 1930 to 1938.



Ten Buffet-Sleeping Cars Like This One Are Being Placed in Service on the Western Lines of the C. N. R.

Slump in Canada Not So Severe

Carloadings up to end of November were down only 7½ per cent under 1937—"Agreed charges" coming soon

By Railway Age's Ottawa Correspondent

CANADIAN railways lost ground, financially, during 1938. In spite of an encouraging industrial and commercial recovery in the eastern provinces, the rail carriers fell back in the last twelve months, largely because of the recession in the United States and the desperate condition of the prairie provinces which have suffered five or six successive years bad crops. Final operating figures of the two roads will not be available for another month, but present indications are that the Canadian National will lean on the federal treasury to the extent of over \$53,000,000, and it is doubtful if the Canadian Pacific will have sufficient surplus to take care of interest charges.

One adverse condition affecting both railways was the increased wage bill. It was not until 1938 that the carriers felt the full effect of the restored wage level, and still another handicap for both roads was the rise in tax accruals. Both of these items swelled operating expenses. For both roads, though, operating nets from their respective hotel systems were higher than in the previous year, and the snow-removal bill was not as high as in many previous years.

Three Significant Happenings

There were three outstanding railway events during the year in Canada. One was continuance of the campaign of Sir Edward Beatty, president of the Canadian Pacific, for unification of the two roads, and the carrying of this fight once more into the Senate at Ottawa, where a special committee studied for over two months the Beatty scheme, but failed to make a report to the Senate. The second event was the final enactment of the bill of C. D. Howe, Transport Minister, to transform completely the rate-making machinery by estab-

lishing government regulation of carriage by water, rail and air, through a licensing system, and provision for carriage of freight under "agreed charges", by rail, water and air. The third development came near the end of the year with the announcement by the Canadian National directorate that it would immediately begin a \$12,600,000 program to rehabilitate and prepare for use the partially constructed terminal facilities in Montreal.

Unification Controversy

Soon after the opening last February of the session of parliament at Ottawa, Hon. Charles P. Beaubien, a Montreal Conservative member of the Senate, in a vigorous speech pictured what he regarded as the calamitous condition of the Canadian National and demanded that immediate steps be taken to stop the bleeding of the taxpayers to meet the annual operating deficits of the National system. His speech was supported by other Conservatives, and finally he demanded the naming of a special committee to make a further study of the Beatty unification scheme which had previously been examined and reported adversely upon by the famous royal commission, headed by Sir Lyman Duff, Chief Justice of Canada's Supreme Court.

This special committee, which had as its joint chairmen Senator Beaubien, Conservative, and Senator George P. Graham, Liberal and former Minister of Railways and Canals, heard most of the officers of the two railways, and also spokesmen for labor and for commercial interests. The labor representatives opposed the merger because they felt it did not provide adequate safeguards for railway employees, a large number of whom must be displaced if the unification

plan were to succeed. Arthur Meighen, Conservative leader in the Senate, put it bluntly when he declared, "What's the use in trying unification if you can't fire men?"

Sir Edward Beatty repeated his claims that a saving of from \$50,000,000 to \$75,000,000 could be effected under unified management of the two roads. The Canadian National officers vigorously challenged this claim and argued that under the most favorable circumstances the saving would not be more than \$18,000,000, and then only after causing distress to railway labor, robbing important communities of railway service and, generally, disrupting the national economy.

Liberal members of the committee, including Senator Graham, went further and declared that unification meant the tearing up of tracks, the razing of stations and the firing of men; that a dollar saved to railway investors meant much more of a loss to the country as a whole; that, in short, the problem presented by the unification proposal was political, was national, much more than one only of railway economics. It was also argued any government that approved of unification would be promptly thrown out of office by the electorate, that the people would object to the firing of railway employees and the curtailment of railway service, even though it might effect a saving to both roads. Railway service, Liberals argued, was a national service. The committee did not present a final report last session, and while it is rumored it will be resumed in the session which opens this month, there does not appear to be much likelihood of any more progress being made than was achieved last session.

High Hopes in "Agreed Charges" Plan

The government feels it has made a substantial move to help the railways by the transport bill of Mr. Howe. This measure was introduced in the 1937 session and it was thrown out by the Senate after being dealt with in a committee, and it never reached the House. The chief objection to the 1937 bill was that it sought to establish even a limited regulation of highway competition by providing for federal licensing of trucks engaged in inter-provincial traffic. Another objection to it was that it aimed to control inter-coastal water traffic.

When the bill was reintroduced in the House in 1938 by Mr. Howe he omitted the provisions that had proved objectionable the previous year, and the measure received House passage with little opposition, but it was given rough treatment again in the Senate committee. Eventually, Mr. Howe, ruffled by repeated moves to rob the measure of some of what he regarded its important features, virtually presented an ultimatum to the Senate, which has a Conservative majority, that is, a majority against the administration which is Liberal and controls the House, the elective chamber. The bill passed but its operation, excepting for the provisions to set up a Board of Transport Commissioners and extend their powers and duties, was delayed until late in the year. The part affecting control of rates on the Great Lakes was deferred until the coming season of navigation.

The "agreed charges" plan, which is the first experiment in Canada in this plan of aiding the railways in their competition with the highways, while proclaimed effective in the late fall, has not yet been tried for the simple reason that this is radical departure in freight rate-making and the railways are moving cautiously, anxious not to make any false start. It is expected that within a month the two roads, together with important shipping organizations, will have reached agreement with the Board of Transport Commissioners as to

the form of the agreement between shipper and carrier, and when that form has been determined it is stated the two roads will be ready to conclude rate agreements with certain larger shippers in the Dominion.

Montreal C. N. R. Terminal

Announcement by the Canadian National that it will spend over a period of three or four years more than \$12,000,000 in rehabilitating its terminal facilities in Montreal is looked upon as a set-back to the unification campaign. While it was certainly not adopted for that purpose, it in effect was a declaration that the publicly-owned road would not entertain the idea of joint use of the Windsor Street C. P. R. station for passenger traffic, as has many times been urged. Even though the two roads have gone a considerable distance in making joint savings by linking terminal facilities and other transportation services in various centers, including joint ownership and operation of the new and palatial hotel in Vancouver, the Canadian National is determined to preserve its place and identity in the country's largest city.

Sir Henry Thornton had planned the spending of at least \$50,000,000 on a vast station and traffic center, as well as railway headquarters, in the heart of Montreal, and nearly \$10,000,000 had been spent in excavating a big hole out of solid rock in an area bisected by Dorchester Street. But that job was suspended by the Bennett government and for seven or eight years the hole has remained as an eyesore. In addition, the ground work for a pretentious viaduct from the site of this terminal across the south part of the city to connect with the Victoria bridge across the River St. Lawrence had been done, but for the past seven years the only use to which the viaduct has been put has been the occupancy intermittently of Canadian National staffs in the various offices located under the viaduct.

The present plan, which will require about four years to complete, is to spend about \$8,000,000 on a new station, facing south from below Dorchester street, arrange new approaches to this station, lay tracks on the viaduct to the river and within two years, at the most, make the new facilities available for passenger train use.

Views of Sir Edward Beatty

Sir Edward Beatty, chairman and president of the C. P. R., in his statement reviewing the outstanding developments of the year said, among other things, the following:

"The trend of events may be gathered from the fact that, according to the Dominion Bureau of Statistics, car loadings for the year up to November 25 totaled 2,178,146, a decline as compared with the same period in 1937 of 176,041 cars, or 7.5 per cent while total cars received from connecting railroads during the same period were 951,210, a decline of 266,628, or 21.9 per cent. These figures represent a drastic decline in the country's movement of freight traffic, and they are all the more notable when it is remembered that increased Western grain crops resulted in freight car loadings of grain and grain products totaling 305,421, or an increase of 70,326 over those of the previous year. Figures for the period under review show only two other classifications in which there were increased loadings, namely pulpwood and ores. The former increased by 5,032 cars and the latter by 17,271, thus reflecting continued development in the industries they represent. We find that loadings of coal are down by 57,512 cars while other im-

portant declines to be noted are, pulp and paper, 40,034; lumber, 25,630; live stock, 25,990; merchandise, l. c. l., 23,559; while loadings of goods coming under the classification "miscellaneous" are down by 80,643 cars. I take it that this is a fairly accurate picture of what has happened to the country's business at large over the past year; certainly, it reflects the movement of most lines of commodities and covers practically all parts of the country.

"Despite serious contraction of revenues, the railways of Canada during the past year have not failed to maintain the efficiency of their services to the public of this country. In that respect the Canadian Pacific can look with considerable satisfaction to the record made. To our motive power we have added 35 engines of the newest type, including 10 "Selkirks", which were specially designed for hauling heavy loads over the Rocky Mountains. We have also added to our equipment 2800 freight cars of various kinds which will replace antiquated and worn-out rolling stock and thus ensure the prompt and careful handling of commodities. The company's freight pick-up and delivery services have been considerably extended. Since its inception, this service has steadily grown in popularity, and in conjunction with fast moving trains has effectively accelerated freight movements.

"As a part of our policy of maintaining the property at the highest possible point of efficiency we have progressed still further with the air-conditioning of passenger cars and with the providing of new-up-to-date coaches on many of our regular trains."

President Hungerford's Statement

"The first check on the gradual recovery of Canadian National earnings from the low level of 1933" reads the statement of S. J. Hungerford, president of the Canadian National, "began with the decline in business activity in the last months of 1937, a decline which continued throughout a great part of 1938. The decline was first felt and was most marked on the United States lines of the company.

"The problem of reducing expenses in the face of declining traffic was made more difficult than it otherwise would have been on account of increases in the price of fuel and other supplies, the restoration of wage

rates to pre-depression levels in Canada—agreed upon early in 1937 and fully operative on April 1, 1938—and an increase in wages above pre-depression levels on United States lines. These factors, together with a program of creating a reserve of freight cars and locomotives in the expectation of a large crop movement, limited the reduction in operating expenses. The increases in wage rates, resulting from protracted wage negotiations with organized labor in Canada and the United States, alone amounted to several millions of dollars. Notwithstanding these adverse factors, it proved possible to reduce the operating expenses of the system by approximately \$4,500,000 from the 1937 level. It is gratifying to be able to record that the steps taken to curtail expenses did not impair efficiency.

"The decline in gross revenues in 1938 was upwards of 15 million dollars and the decline in net revenue between 10 and 11 million dollars, as compared with 1937. Notwithstanding the very difficult operating conditions and the supplying of essential transportation requirements to many parts of the country at heavy expense, the revenues for the year were sufficient to pay all the operating expenses, and leave a balance of net revenue from railway operation of nearly \$7,000,000.

New Cars and Locomotives

"Some new equipment was acquired during the year. Two thousand steel box cars of the most modern design were delivered and have proved valuable in handling high class traffic. Ten air-conditioned buffet sleeping cars, 6 air-conditioned dining cars, 5 mail and express cars, 25 sand cars and 24 snow plows have been added to the company's equipment. Locomotives purchased consisted of six 4-8-4 type semi-streamlined passenger engines, designed for use in the heavy fast passenger train service to and from Chicago, and two diesel switching locomotives for use on the United States lines.

"The Canadian National branch line serving the mining development in Northern Quebec between Senneville and Rouyn, which had been under construction for the past two years, was completed and was formally opened on December 3. This line serves a region which has proved to be rich in mineral wealth, and with the provision of direct railway transportation, it is anticipated that further development will take place."

The C. P. R. Opened This Attractive Sandwich and Soda Shop in Its Royal York Hotel, Toronto, in July, 1938



Mexican Railways Now Under Workers' Administration

Operation of the national lines taken over during the year by a committee of workers appointed by the union

ON May 1, 1938, a workers' administration took over the Mexican National Railway Lines, as a culmination of what amounts to a complete reorganization of the railways in the southern republic during the last year and a half. This reorganization began on June 23, 1937, when a presidential decree was issued expropriating the properties of the National Railways of Mexico and certain other lines (about 84 per cent of Mexico's total railway mileage) and the government took over the railways under the direct supervision of a "railroad autonomous department," which was headed by Antonio Madraza, former executive president of the National railways.

This arrangement did not satisfy the labor leaders, who were skeptical of the results that could be obtained, and they continued to work along the lines of turning the railways over to the employees. After protracted negotiations with the government, an agreement was reached, and a decree issued on April 23, 1938, whereby the roads and all their property were turned over to a workers' administration on May 1.

The New Administration

The workers' administration now in charge is composed of seven members, chosen by the Union of Mexican Railroad Workers, one member being appointed chairman of the board and general manager of the railways for a period of two years, subject, under certain circumstances, to removal from office before the expiration of his term, or to reappointment after the term has expired. This general manager, Salvador J. Romero, has general direction of operations, but must request authority from the board for new construction, loans, yearly program and appropriations, as well as other important matters. The administration must obtain authority from the federal government for the construction of new lines or the abandonment of existing lines; to sell or mortgage property; to lease tracks to or from other railroads; and to contract loans. The existing labor laws and labor contracts continue in force; and the government supervises the accounting and distributing of funds, and verifies the amounts applied to additions and betterments.

The workers' administration is operating the railways under agreement with the government:

1. To keep the operating ratio under 85 per cent.
2. To invest at least 5.36 of the gross earnings in additions and betterments.
3. To pay the government 5.65 per cent of the gross earnings when they reach \$125,000,000* or more per annum, or 3.64 per cent if they do not reach that figure.
4. To apply excess earnings, after deduction of losses from subsidiary railways, in the following ratio: 25 per cent for additions and betterments; 25 per cent to the

government (but not more than a maximum payment of 8.96 per cent of the gross earnings to the government in any one year); 25 per cent to the railroad workers' fund; and 25 per cent to a reserve fund.

Although the national railways continue to be the property of the government under this arrangement, the workers' administration is entirely decentralized from the government. It has what is termed "judicial personality" over the properties of the National Railways of Mexico, 7,040 miles; the Tehuantepec, 190 miles; and the Vera Cruz-Alvarado, 45 miles. The Interoceanic, 1,025 miles, is also operated by the workers' administration, although this railway, which shows an average annual loss of \$5,000,000, is recognized as private property.

Payment of Obligations

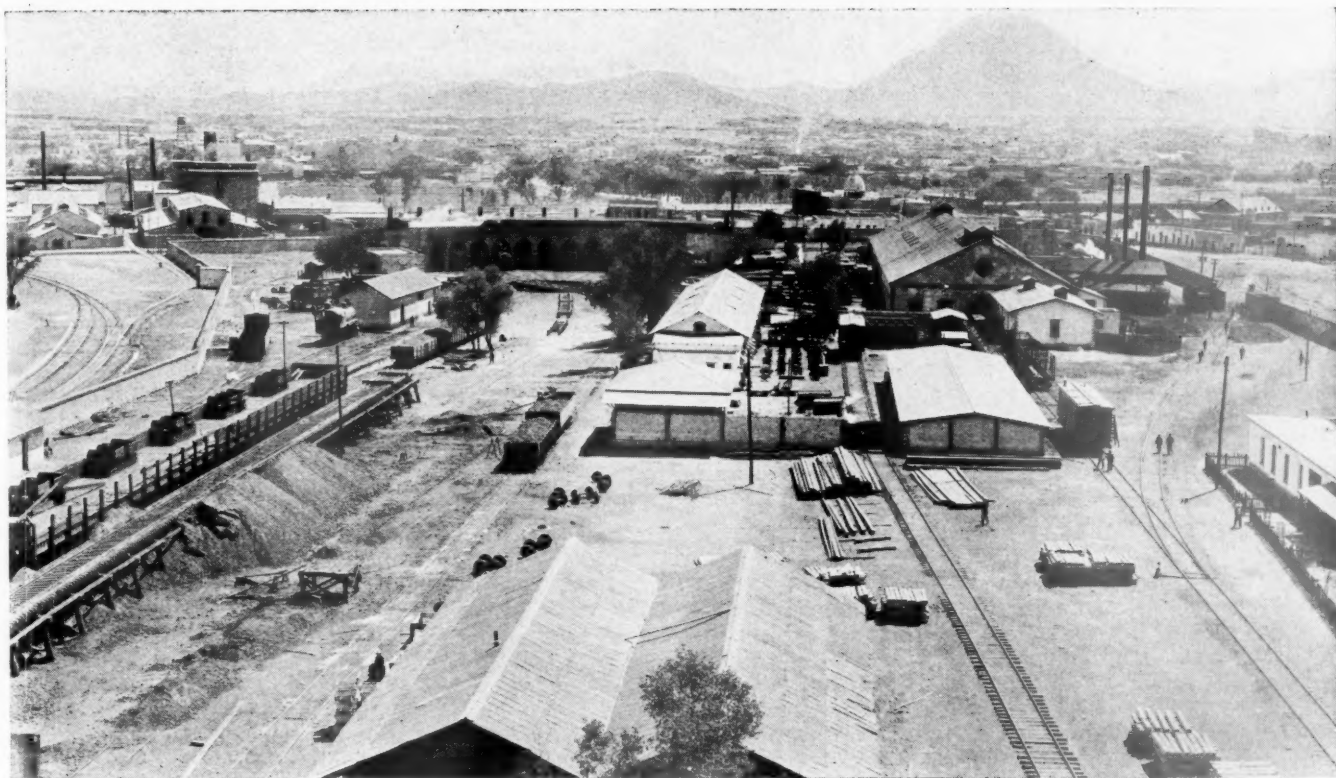
When the workers' administration took over the railways last spring, payment of immediate obligations was suspended temporarily, since there was no money left over from the previous management, but this proved to be only a temporary condition, and, as soon as money was again available from current revenues, payments were resumed. The floating debt on May 1 amounted to \$18,870,302, which included the sums of \$3,500,000 for per diem due to U. S. railways, and \$2,000,000 in bills payable at the New York office of the Mexican railways. This debt left by the previous administration has been somewhat increased because of payments for new locomotives and other reasons, leaving the balance, on October 31, at \$24,026,645.

According to President Cardenas, the new railway administration has carried out its obligations to the government in full, making the necessary payments in accordance with the decree forming the workers' adminis-



A Decorative Narrow-Gauge Diner Installed on Oaxaca Line This Year

* All monetary figures given in this article are quoted in Mexican pesos, currently quoted at \$4.95 Mexican to one U. S. A. dollar.



Yards and Shops of the Mexican National Lines at Chihuahua

tration. Moreover, the present administration, in the first five months of its operation, maintained an operating ratio of 81.63 per cent, gross operating earnings having

Classified Freight Transported, in Tons, (9 Months 1938-1937)

Articles	1938	1937	Inc.	Dec.	% Inc.	% Dec.
Rice	29,568	47,198	.....	17,630	...	36.7
Fuel Oil	296,777	306,097	.....	9,320	...	3.0
Cotton	63,981	76,671	.....	12,690	...	16.6
Sugar	212,628	173,242	39,386	.....	20.7	...
Coffee	36,593	37,836	.....	1,243	...	3.3
Coal	418,594	468,710	.....	50,116	...	10.7
Charcoal	97,694	116,085	.....	18,391	...	15.8
Cement	172,331	181,014	.....	8,683	...	4.8
Beer	74,204	92,943	.....	18,739	...	20.2
Coke	214,838	339,236	.....	124,398	...	36.7
Construction Steel	53,863	82,063	.....	28,200	...	34.4
Fruits and Vegetables	508,440	506,442	1,998	.....	0.4	...
Beans	46,139	64,289	.....	18,150	...	28.2
Gasoline	172,729	227,601	.....	54,872	...	24.1
Cattle	124,059	140,371	.....	16,312	...	11.6
Flour	63,003	81,497	.....	18,494	...	22.7
Lumber	225,935	293,467	.....	67,532	...	23.0
Corn	272,763	320,195	.....	47,432	...	14.8
Lard	15,052	20,587	.....	5,535	...	26.9
Machinery	23,977	36,865	.....	12,888	...	35.0
Bullion	214,493	243,772	.....	29,279	...	12.0
Petroleum	350,826	326,408	24,418	.....	7.5	...
Minerals	954,264	1,166,741	.....	212,477	...	18.2
Pulque	73,336	78,765	.....	5,429	...	6.9
Wheat	221,349	146,057	75,292	.....	51.5	...
Salt	60,884	69,818	.....	8,934	...	12.8
Wines and Liquors	13,731	17,697	.....	3,966	...	22.4
Miscellaneous	2,370,311	2,935,401	.....	565,090	...	19.3
Total	7,382,362	8,597,068	.....	1,214,706	...	14.1

been \$59,545,240, as against operating expense of \$48,609,173.

Results Obtained

This result has been attained in the face of certain factors that have resulted in decreased revenue and increased expenses and have thus mitigated against the success of the new administration. The accompanying table, analyzing the traffic handled, shows a decrease of 14.1 per cent in the first nine months of 1938, as compared with the same period in 1937. The principal loss

of traffic occurred as a result of a strike at the coal mines at Rosita, Coahuila, which lasted a month, and resulted in a loss of coal traffic with revenues estimated at a million pesos, and caused other traffic losses from industries using this coal when the supplies were shut off. Also, a cyclone, which struck the northeastern part of the country in September, caused much damage to the tracks, bridges and buildings on the Gulf and Cardenas divisions, traffic being interrupted for 15 days on the important lines between Tampico and Cardenas and between Tampico and Monterrey.

Floods caused severe damage to the tracks in the state of Tamaulipas, between Monterrey and Matamoros, and the total storm damage is estimated at three million pesos.

Unfavorable currency exchange conditions also caused a sharp drop in the number of cars imported through both the rail gateways and the ocean ports, as shown in

Loaded Cars Interchanged

	NUMBER OF CARS		Exports	
	Imports		1938	1937
Laredo	1938	1937	4,270	7,032
El Paso	1,840	2,207	5,616	3,082
Eagle Pass	796	1,031	929	904
Brownsville	52	330	294	256
Total	6,958	10,600	11,558	8,058
WATER PORTS				
Tampico	740	1,296	11,183	8,322
Vera Cruz	1,282	2,279	3,024	4,538
Manzanillo	456	822	8	33
Total	2,478	4,397	14,215	12,893

the accompanying table, and the increase in exports did not make up for this loss.

With the exception of four classifications, all classes of freight showed decreases in 1938, the total number of tons handled in the first nine months being 7,382,362,

as compared with 8,597,068 in 1937, a decrease of 14.1 per cent. Net ton-miles in 1938 were 3,019,230,625, as compared with 3,050,592,500 in 1937, a decrease of 1 per cent. The gross earnings for the first nine months of 1938 were \$107,286,325, as compared with \$107,541,245 in 1937, a decrease of \$254,920 or 0.2 per cent. Operating expenses increased from \$87,201,392 in 1937, to \$90,628,779 in 1938, or 3.93 per cent, which reduced the net earnings from \$20,339,853 to \$16,657,546, or 18.1

Operating Statistics, 10 Months of 1938

	1937	1938	% Inc.	% Dec.
Locomotive miles	21,542,275	22,219,895	3.1	..
Passenger train miles ..	6,313,630	6,523,475	3.3	..
Freight train miles	8,352,450	8,723,325	4.4	..
Mixed train miles	2,183,765	2,275,095	4.7	..
Total train miles	16,899,180	17,589,320	4.1	..
Passenger car miles	52,027,525	53,393,035	2.6	..
Freight car miles	122,379,530	120,897,855	..	1.2
Empty freight car miles ..	56,068,020	60,192,790	7.3	..
Total car miles	178,298,805	181,090,645	1.5	..
All cars handled	425,273	436,829	2.7	..
Net ton-miles	3,050,592,500	3,019,230,625	..	1.0
Gross ton-miles	7,157,263,125	7,260,920,625	1.4	..
Car miles per car day ..	32.9	32.6	..	0.9
Freight net ton-miles per hour	775	745	..	3.86
Average tons per car ..	24.93	24.97	0.2	..
Freight train speed (miles per hour)	13.2	13.2	..	..
Miles per locomotive day (freight)	115	111.8	..	2.7
Miles per locomotive day (passenger)	151	133.7	..	3.3
Miles operated	8,065	8,300	2.9	..

per cent. The average operating ratio during the first nine months of 1938 was 84.47. Operating statistics for the first ten months of 1938 are given in the accompanying table.

High labor costs have been one of the major problems facing the workers' administration. Indicative of this is the increasing cost of repairs to rolling stock, despite the decline in material prices. Statistics show that the upward trend of labor costs has increased the cost of repairs to locomotives and cars materially. For example, during the 12 months ending with September, 1938, labor expended for repairing passenger cars increased from \$161.23 per car in 1937 to \$168.74 per car this year, while materials decreased from \$127.75 to \$121.83 per car. Likewise, labor costs for maintenance increased from \$20.12 to \$20.84 per 725 miles run, while materials showed a decrease from \$15.95 to \$15.05. The average cost per car for labor employed in repairing freight cars during the same period increased from \$18.62 to \$20.00, while the cost of materials decreased from \$19.82 to \$18.74. Similarly, the labor cost for maintaining this equipment per 725 miles run increased from \$14.61 to \$15.39, while materials decreased from \$15.55 to \$14.43.

On locomotive repairs in the back shop, the labor cost increased from \$154.47 to \$176.58 per locomotive per 725 miles run, while materials used decreased from \$100.34 to \$96.04. Running repairs cost \$138.67 for labor, as against \$115.46 the previous year, and material costs decreased from \$34.13 to \$33.46.

Additions and Betterments

Under the terms of its agreement with the government, the workers' administration is required to apply 5.63 per cent of the gross earnings to additions and betterments. During the first four months of the new administration, gross earnings amounted to \$48,263,152 and, according to the agreement, this required a minimum investment in additions and betterments of \$2,586,904; however, the new administration invested nearly twice that much, or \$4,876,246, of which \$3,211,007 rep-

resented payment for the new locomotives and rolling stock purchased in the United States.

Some time ago, four major railway construction projects were started to tap the resources of potentially productive but undeveloped sections of Mexico by providing adequate transportation for the products of these regions. These projects have been continued under the workers' administration, their present status being as follows:

Ixcaquixtla to Chacahua—\$6,337,197 has been invested in this new line, construction of which was started in the latter part of 1935, and which is now completed for 75 miles, and in operation between Ixcaquixtla and Petalcingo.

Southeastern Line—This project covers 477 miles from Puerto Mexico to Campeche, in the states of Vera Cruz, Tabasco, Chapas and Campeche. The surveys are complete, the grading has been completed for 200 miles, and 138 miles of rail has been laid. About \$32,502,141 has already been spent on this line.

Caltzonzin-Apatzingan-Zihuatanejo—This line, in the state of Michoacan, has cost \$18,339,077 so far. Grading and culverts have been completed and five large bridges are already in service, while the two longest bridges on the line are under construction. Rails have been laid for 49 miles.

Fuentes Brotantes-Punta Penasco—This line, 107 miles long, in Lower California, has been completely surveyed and the roadbed has been completed for a distance of 65 miles at an expenditure of \$5,962,998.

Other Mexican Railways

Privately-owned railways, constituting some 16 per cent of the total mileage, the principal of which are the British owned Mexican Railway, between Mexico City and Vera Cruz, and the Southern Pacific of Mexico, extending from Nogales on the U. S. border to Guadalajara, while not under control of the workers' administration, are subject to the labor agreements and the rates of pay promulgated by the Union of Mexican Railway Workers. As a result, they have been showing large operating losses for the past few years, and, in an attempt to reduce these losses, the S. P. of Mexico, comprising 1,370 miles of line, proposed to put reductions in the rates of pay in effect on September 1, 1938. The union objected strenuously to this, claiming that defects in management, rather than high wage rates, were responsible for the losses, and suggested a reorganization as a solution to the problem. The federal government being in accord with the union on this matter, on December 1, 1938, C. C. Rochin, general superintendent of transportation for the railways under the control of the workers' administration, was given a leave of absence for six months, and appointed general manager of the Southern Pacific of Mexico, charged with the task of carrying out the reorganization plan.

The results of this experiment in employee operation are available for a period of only a few months. Under the circumstances, sufficient data are not at hand to judge the success or failure of the workers' administration. The test of the present management will be shown in the results attained during 1939.

THE CANADIAN PACIFIC lake steamers "Keewatin" and "Assiniboia", according to the year-end statement of President Sir Edward Beatty, went into service last season with important improvements in addition to the regular winter check-over. Tiled flooring, built-in baths, and showers were some of the conveniences installed, while each ship also had seven staterooms entirely modernized, five equipped with twin beds, two with double beds. Attractive panelling and tasteful furnishings completed these rooms.

Finances — Still Singing the Blues

Security prices follow earnings to lowest levels since 1932—More roads go broke—New financing meager

By J. G. Lyne

Assistant to Editor

THE year 1938 was one of almost complete stagnation as far as railway finances were concerned. Net income, as related in more detail elsewhere in this issue, was a minus quantity—the net deficit being \$125,000,000, which is the worst on record except 1932, when the red ink figure was \$139,000,000. On the other hand, gross revenues in 1938 were about \$425,000,000 larger than they were in 1932, indicating that the unfavorable financial showing of the year just past is ascribable to higher costs—wages, taxes and materials—rather than to the level of traffic.

Only 1932 Was Worse

As was to have been expected under such conditions, the Stock Market prices of railroad securities declined sharply in the months of most meager earnings, and only began their recovery in the later months of the year, when the railroads began once more to show a measurable volume of net railway operating income. The course of

stock and bond prices, and its relationship to dividends paid, is shown graphically on Chart A for the period 1923-38 inclusive. In Chart B, stock and bond prices for the year 1938 alone are shown, the figures used being those of 20 representative stocks and 20 representative bonds. It will be noted that the lowest prices recorded were at the end of March, and that by November the averages had returned, practically, to the levels which obtained at the beginning of the year. Thereafter, there was some recession, but the year closed with security prices once more on the upgrade.

The unfavorable financial status of the railroads, as compared to unregulated industry, is disclosed by the indexes of security prices compiled by Dow, Jones & Co., who compute such averages not only for railroad securities, but for those of industrial concerns as well. The Dow, Jones index of railroad stock prices in 1938 ranged between a low of 19 and a high of slightly more than 33. During the same 12-month period, the Dow, Jones average industrial stock prices had a range between

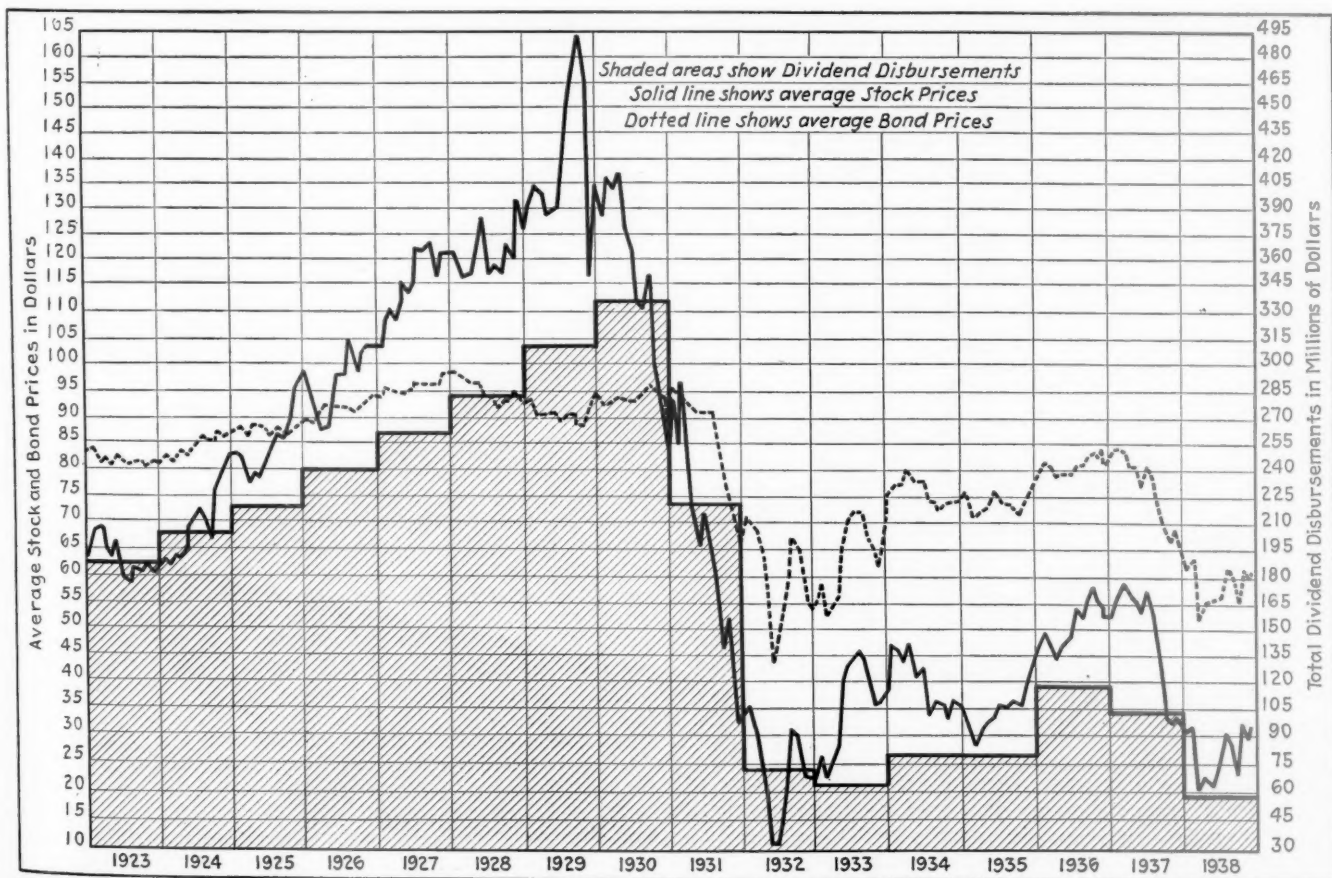


Chart A—Average Price of 20 Representative Stocks and 20 Bonds, with Dividends of 20 Railroads on Same Relative Scale

Railway Securities Sold to Public in 1916 and 1920 to 1938

Year	Bonds	Notes	Stock	Total R. R. financing	Total all financing	Per Cent R. R. to total
1916.....	\$229,000,000	\$126,000,000	\$16,000,000	\$371,000,000	\$1,864,000,000	19.9
1920.....	194,583,000	193,840,000	3,737,000	392,160,000	3,324,922,000	12.1
1921.....	455,125,000	202,928,300	27,222,500	685,275,800	2,780,874,000	24.6
1922.....	299,025,800	288,936,500	27,068,100	615,030,400	3,200,176,000	19.2
1923.....	165,956,000	354,720,500	59,140,850	579,817,350	3,602,704,000	16.0
1924.....	620,347,000	351,276,200	11,000,000	982,623,200	4,185,590,000	23.5
1925.....	374,020,500	151,753,740	30,934,430	556,708,670	5,234,992,000	10.6
1926.....	241,954,000	172,477,000	41,577,200	456,008,200	5,746,354,000	7.9
1927.....	686,939,500	89,184,600	210,596,900	986,721,000	7,830,641,000	12.6
1928.....	525,719,000	79,911,000	187,369,100	792,999,100	8,473,880,000	9.4
1929.....	418,984,000	180,322,000	275,269,240	874,575,240	11,007,170,000	7.9
1930.....	800,694,000	142,168,000	63,805,600	1,006,667,600	5,920,498,000	17.0
1931.....	453,824,000	105,209,000	.....	559,033,000	2,730,082,000	20.5
1932.....	11,827,000	13,125,000	.....	24,952,000	684,806,000	3.6
1933.....	12,000,000	.....	.....	12,000,000	335,812,000	3.6
1934.....	172,074,000	71,068,000	.....	243,142,000	618,627,000	39.3
1935.....	107,746,000	57,372,000	.....	165,118,000	2,190,093,550	7.6
1936.....	592,254,000	77,580,000	.....	669,834,000	4,061,901,025	16.5
1937.....	60,547,000	100,500,000	.....	161,047,000	1,589,043,484	10.1
1938*.....	30,000,000	6,270,000	.....	36,270,000	1,474,389,000	2.5

* 11 Months Total as Compiled by Dow Jones & Co.

99 and over 158. The mean price of railroad stocks was thus only about one-fifth that of the industrials. Back in the days of the 1921 depression, by way of contrast, both railroad and industrial shares touched about the same low point (around 65)—which gives some idea of the decline the railroad industry has suffered relative to that of other industry, in this 17-year period since 1921.

Little New Financing

As was to be expected under these conditions, offerings of new securities were virtually non-existent—the

during the year, but only one or two of them were of sufficient size to be accorded the dignity of a public offering by the investment firms which acquired them from the issuing companies. The principal equipment issues were the following: January, A. T. & S. F., \$3,900,000, interest cost to railroad, 1.95 per cent; March, C. M. St. P. & P., \$2,235,000, cost 3.91 per cent; April, Bangor & Aroostook, an issue of \$400,000, cost 2.82 per cent, and an issue of \$1,500,000, cost 2.68 per cent; July, P. R. R., \$6,330,000, cost 2.696 per cent; August, N. Y. N. H. & H., \$1,640,000, cost 3.97 per cent; August, S. A. L., \$1,675,875, cost 4 per cent; October, R. F. & P., \$740,000, cost 1.82 per cent.

The Southern sold two issues of its equipment certificates, one of \$500,000 and one of \$6,000,000, to the R. F. C. at an interest cost of 4 per cent. A couple of issues were sold during the year which covered 100 per cent of the purchase price of the equipment covered, an arrangement which was approved by the Interstate Commerce Commission only over the vigorous protest of Commissioner Porter.

Dividend Changes

There were not many changes in dividends rates on railroad stocks during the year, principally for the rea-

Year Ended	Dividends*	Proportion of Net Income Paid in Dividends	Taxes*
June 30			
1911.....	\$397,068,724	81	\$98,626,848
1912.....	339,964,855	85	109,445,407
1913.....	322,300,406	66	118,386,859
1914.....	376,098,785	108	135,572,579
1915.....	259,809,520	82	133,276,330
1916.....	281,936,371	47	145,517,034
Year Ended December 31			
1916.....	306,176,937	47	157,113,372
1917.....	320,395,779	53	213,920,095
1918.....	275,336,547	71	223,175,379
1919.....	278,516,908	63	232,601,396
1920.....	271,731,669	63	272,061,453
1921.....	298,511,328	95	275,875,990
1922.....	271,573,751	73	301,034,923
1923.....	296,127,048	53	331,915,459
1924.....	320,429,767	57	340,336,686
1925.....	342,020,885	49	358,516,046
1926.....	399,243,963	49	388,922,856
1927.....	411,581,093	61	376,110,250
1928.....	430,677,138	55	389,432,415
1929.....	490,125,673	55	396,682,634
1930.....	497,024,912	95	348,553,953
1931.....	330,150,873	245	303,528,099
1932.....	92,354,322	def.	275,135,399
1933.....	95,725,783	def.	249,623,190
1934.....	133,418,896	def.	239,624,802
1935.....	126,282,306	1675	236,944,985
1936.....	169,829,290	103	319,752,721
1937.....	167,902,034	171	325,665,165

* Not including switching and terminal companies.

only large ones being an issue of \$30,000,000 of 3½ per cent, 25-year refunding and improvement mortgage bonds by the Chesapeake & Ohio, which was sold to the underwriters at par and priced for public sale at 101½; and an issue of \$28,000,000 first mortgage 3½ per cent, 24-year first mortgage bonds, by the Duluth Missabe & Iron Range, which was priced by the underwriters at 98. The Express Agency also sold an issue of serial notes, maturing in from six months to 10 years, which was priced by the underwriters to yield 3⅞ per cent to 2½ per cent.

Several issues of equipment trust certificates were sold

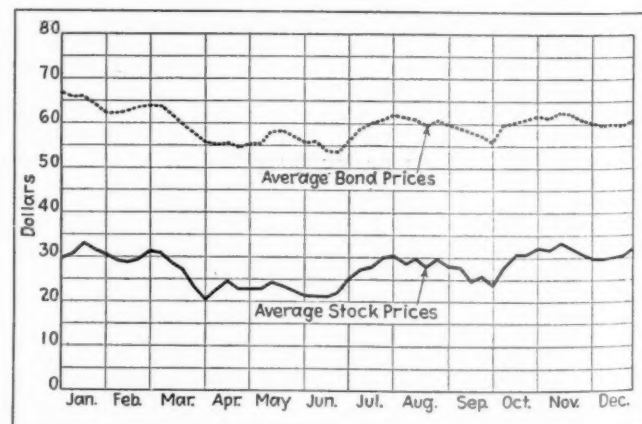


Chart B—Fluctuations in Average Prices of Twenty Representative Railroad Stocks and Twenty Bonds in 1938

son that so few of such securities have paid anything in recent years. A few changes, however, are to be noted—all of them downward. The Alabama Great Southern's extra disbursement in 1938 was \$3, as compared with \$4

Status of Railroad Loans by the R. F. C., November 30, 1938

	Disbursed	Repaid		Disbursed	Repaid
Aberdeen & Rockfish	\$127,000.00	\$127,000.00	Minneapolis, St. Paul & Sault Ste. Marie*	\$6,843,082.00	\$6,843,082.00
Alabama, Tennessee & Northern	275,000.00	90,000.00	Mississippi Export	100,000.00	100,000.00
Alton	2,500,000.00	605,367.13	Missouri-Kansas-Texas	2,300,000.00	2,300,000.00
Ann Arbor (Receivers)	634,757.00	434,757.00	Missouri Pacific	23,134,800.00	.....
Ashley, Drew & Northern	400,000.00	400,000.00	Missouri Southern	99,200.00	99,200.00
Baltimore & Ohio	95,343,399.59	12,171,721.15	Mobile & Ohio	785,000.00	785,000.00
Birmingham & Southeastern	41,300.00	41,300.00	Mobile & Ohio (Receivers)	1,070,599.00	1,070,599.00
Boston & Maine	9,569,437.00	5,602.19	Murfreesboro-Nashville	25,000.00	.....
Buffalo, Union Carolina .....	.....	.....	New York Central	27,499,000.00	27,499,000.00
Carlton & Coast	535,800.24	139,908.71	New York, Chicago & St. Louis	18,200,000.00	18,200,000.00
Carolina, Clinchfield & Ohio	14,150,000.00	220,691.50	New York, New Haven & Hartford	7,699,778.34	755,759.93
Central of Georgia	3,124,319.00	464,298.94	Pennsylvania	28,900,000.00	28,900,000.00
Central of New Jersey	464,298.94	32,000.00	Pere Marquette	3,000,000.00	3,000,000.00
Charles City Western	140,000.00	155,632.18	Pioneer & Fayette	17,000.00	11,000.00
Chicago & Eastern Ill.	5,916,500.00	4,338,000.00	Pittsburgh & West Virginia	4,975,207.00	758,600.00
Chicago & North Western	46,588,133.00	838.00	Puget Sound & Cascade	300,000.00	300,000.00
Chicago Great Western	1,289,000.00	32,000.00	St. Louis-San Francisco	7,995,175.00	2,805,175.00
Chicago Great Western (Trustees)	150,000.00	537.50	St. Louis-Southwestern	18,672,250.00	18,672,250.00
Chicago, Milwaukee, St. Paul & Pacific	11,500,000.00	.....	Salt Lake & Utah (Receivers)	200,000.00	200,000.00
Chicago, Milwaukee, St. Paul & Pacific (Trustees)	3,840,000.00	981,000.00	Salt Lake & Utah	400,000.00	.....
Chicago, North Shore & Milwaukee	1,150,000.00	.....	Sand Springs	162,600.00	162,600.00
Chicago, Rock Island & Pacific	13,718,700.00	.....	Southern Pacific	36,000,000.00	22,000,000.00
Cincinnati Union Terminal	8,300,000.00	8,300,000.00	Southern	44,905,000.00	2,275,796.00
Colorado & Southern	29,450,800.00	1,553,000.00	Sumpter Valley	100,000.00	100,000.00
Columbus & Greenville	53,500.00	53,500.00	Tennessee Central	5,147,700.00	147,700.00
Copper Range	2,000,000.00	500,000.00	Texas, Oklahoma & Eastern	700,000.00	700,000.00
Delaware, Lackawanna & Western	8,081,000.00	1,800,000.00	Texas & Pacific	30,000.00	30,000.00
Denver & Rio Grande Western	1,800,000.00	71,300.00	Texas-South-Eastern	39,000.00	39,000.00
Denver & Rio Grande Western (Trustee)	3,182,150.00	582,000.00	Tuckerton	15,731,583.00	.....
Denver & Salt Lake Western	16,582,000.00	393,706.20	Wabash (Receivers)	4,366,000.00	1,403,000.00
Eureka-Nevada	627,075.00	227,434.00	Western Pacific	3,600,000.00	.....
Florida East Coast (Receivers)	227,434.00	.....	Western Pacific (Trustees)	750,000.00	400,000.00
Fort Smith & Western (Receivers)	8,176,000.00	.....	Wichita Falls & Southern	22,525.00	22,525.00
Fort Worth & Denver City .....	.....	.....	Wrightsville & Tennille .....	.....	.....
Fredericksburg & Northern .....	.....	.....	Totals	\$613,425,739.11	\$190,884,362.43
Gainesville Midland .....	.....	1,061,000.00			
Gainesville Midland (Receivers) .....	.....	.....	
Galveston, Houston & Henderson	3,183,000.00	546,000.00			
Galveston Terminal Railway	546,000.00	6,000,000.00			
Georgia & Florida (Receivers)	354,721.00	13,915.00			
Great Northern	6,000,000.00	520,000.00			
Green County	13,915.00	115,000.00			
Gulf, Mobile & Northern	520,000.00	8,500,000.00			
Illinois Central	35,290,000.00	800,000.00			
Lehigh Valley	9,278,000.00	2,550,000.00			
Litchfield & Madison	800,000.00	50,000.00			
Maine Central	2,550,000.00	.....		
Maryland & Pennsylvania	197,000.00	.....		
Meridian & Bigbee River (Trustee)	985,000.00	.....		

paid in 1937. The Santa Fe voted a disbursement of \$1 on its preferred to be paid early in 1939, its last disbursement (at the beginning of 1938) having been \$2.50. The Chesapeake & Ohio made one quarterly disbursement on

Receiverships and Trusteeships Established in 1938

Name of Road	Mileage	Funded Debt	Capital Stock
Erie	2,403	\$234,933,709	\$214,868,100
New Jersey & New York	46	1,012,960	2,228,600
Nypano .....	.....	28,000,000	20,000,000
Fort Smith, Subiaco & Rock Island	16	400,000	40,000
Minneapolis, St. Paul & Sault Ste. Marie	3,232	91,315,800	37,810,200
New York, New Haven & Hartford* .....	.....	2,170,000†	3,996,000
Boston & Providence .....	.....	9,216,000	9,080,300
Rutland	407	130,000	5,000,000
Virginia & Truckee	67	662,000	134,000
Winchester & Wardensville	23	.....	.....
Total nine companies	6,194	\$367,840,469	\$293,157,200

* Name inserted to show corporate relationship.

† Matured July 1, 1938, unpaid.

its common of 75 cents, one of 50 cents and two of 25 cents, as compared with the total of \$3.80 paid in 1937. The Cincinnati, New Orleans & Texas Pacific paid extra dividends of \$11, as compared to \$22.50 disbursed in December, 1937. The Kansas City Southern paid \$1

Railroads Taken from Receivership or Trusteeship During 1938

Name of Road	Mileage Operated
Cape Fear	10
Colorado-Kansas	23
Gainesville Midland	74
Narragansett Pier	8
Rock Island & Dardanelle .....	.....
Savannah & Atlanta	145
Shelby County	9
Shelby Northwestern	21
Total	290

Mileage in the Hands of Receivers or Trustees

(Figures to 1937, Inclusive, from I. C. C. Statistics for Year Ended December 31, 1937. Figures for 1938 Compiled by Railway Age.)

Year ended	Miles of road operated by receivers or trustees at close of year	Net change during year in miles of road operated	No. of roads in charge of receivers or trustees at close of year
June 30, 1894	40,819	.....	192
1895	37,856	-2,963	169
1896	30,475	-7,380	151
1897	18,862	-11,614	128
1898	12,745	-6,117	94
1899	9,853	-2,892	71
1900	4,178	-5,675	52
1901	2,497	-1,681	45
1902	1,475	-1,022	27
1903	1,185	-290	27
1904	1,323	+138	28
1905	796	-527	26
1906	3,971	+3,176	34
1907	3,926	-45	29
1908	9,529	+5,603	52
1909	10,530	+1,001	44
1910	5,237	-5,293	39
1911	4,593	-664	39
1912	9,786	+5,193	44
1913	16,286	+6,500	49
1914	18,608	+2,322	68
1915	30,223	+11,615	85
1916	37,353	+7,130	94
Dec. 31, 1916	34,804	-2,550*	80
1917	17,376	-17,428	82
1918	19,208	+1,832	74
1919	16,590	-2,618	65
1920	16,290	-300	61
1921	13,512	-2,778	68
1922	15,259	+1,747	64
1923	12,623	-2,636	64
1924	8,105	-4,518	61
1925	18,687	+10,582	53
1926	17,632	-1,055	45
1927	16,752	-880	40
1928	5,256	-11,496	33
1929	5,703	+447	29
1930	9,486	+3,783	30
1931	12,970	+3,484	45
1932	22,545	+9,575	55
1933	41,698	+19,153	78
1934	42,168	+470	80
1935	68,345	+26,177	87
1936	69,712	+1,367	91
1937	70,884	+1,172	109
1938	77,289	+6,405	111

* Represents decrease for six months.*

Railroads in the Hands of Receivers or Trustees on December 31, 1938

(For explanation of data bearing symbols see column headed "Remarks")

Road	Mileage operated	Mileage owned	Date of receivership or trusteeship	Funded debt outstanding	Capital stock outstanding	Total old company securities	Remarks
Akron, Canton & Youngstown.....	171	19	Apr. 4, 1933	\$3,550,000	\$1,500,000	\$5,356,000	
Northern Ohio.....	152	19	Apr. 4, 1933	3,300,000	4,230,000	7,530,000	
Alabama & Western Florida.....	38	19	Nov. 28, 1936	None	153,200	158,700	
Alabama, Tennessee & Northern.....	218	215	Dec. 14, 1934	3,907,289	3,916,560	8,048,737	
Bamberg, Ehrhardt & Walterboro.....	14	14	Nov. 10, 1937	None	123,220	123,220	
Burlington, Muscatine & Northwestern.....	11	11	Nov. 16, 1937	None	100,000	100,000	
California & Oregon Coast.....	15	15	Feb. 19, 1925	209,226	350,000	584,226	
Central of Georgia.....	1927	1460	Dec. 19, 1932	53,722,000	20,000,000	76,517,000	
Chicago & Eastern Illinois.....	927	808	Sept. 15, 1933	33,587,036*	45,891,400	81,029,436	*Includes \$2,736,000 funded debt matured unpaid.
Chicago & North Western.....	8391	8180	June 28, 1935	321,113,700*	180,835,300	514,788,000*	*Includes \$34,070,200 funded debt matured unpaid. "Total old company securities" also includes \$31,000 equipment trust obligations matured and unrepresented.
Chicago, Attica & Southern.....	155	140	Aug. 4, 1931	441,200	2,294,452	2,735,652	
Chicago Great Western.....	1505	995	Mar. 1, 1935	36,062,000	91,282,900	133,847,023	
Chicago, Indianapolis & Louisville.....	573	543	Jan. 1, 1934	26,071,000	15,488,300	41,919,047	
Chicago, Milwaukee, St. Paul & Pacific.....	10,949	9962	June 29, 1935	447,956,252	224,434,854*	703,758,474	*Includes 1,174,060 shares common stock of no par value.
Chicago, Rock Island & Pacific.....	7355	5208	June 8, 1933	249,295,900	128,892,512	408,951,062	
Chicago, Rock Island & Gulf.....	627	635	Nov. 1, 1933	16,583,000	637,000	17,220,000	
Choctaw, Oklahoma & Gulf.....	812	812	Nov. 1, 1933	14,436,000	15,827,500	30,263,500	
Peoria Terminal.....	15	9	Dec. 1, 1933	1,944,000	500,000	2,444,000	
Rock Island, Arkansas & Louisiana.....	376	376	Sept. 1, 1933	15,315,600	1,768,000	17,083,600	
Rock Island Memphis Terminal.....	6*	6*	Nov. 1, 1933	1,300,000	1,000	1,301,000	*All tracks
Rock Island Omaha Terminal.....	3*	3*	Nov. 1, 1933	906,000	10,000	916,000	*All tracks
Rock Island, Stuttgart & Southern.....	21	21	Nov. 1, 1933	180,000	300,000	480,000	
St. Paul & Kansas City Short Line.....	408	408	Sept. 1, 1933	27,812,825	50,000	27,862,825	
Chicago, Springfield & St. Louis.....	87	79	Jan. 24, 1930	500,000	204,960	704,960	Sold at foreclosure in June, 1931, but receiver is still operating the property.
Denver & Rio Grande Western.....	2567	2266	Nov. 1, 1935	120,221,000*	78,903,140**	206,919,140	*Includes \$46,143,000 funded debt matured unpaid. **Capital stock includes 300,000 shares common of no par value.
Denver & Salt Lake Western.....	38	38	Nov. 1, 1935	None	3,631,000	3,631,000	
Duluth, South Shore & Atlantic.....	549	446	Jan. 1, 1937	23,586,000	22,000,000	45,586,000	
Mineral Range.....	27	27	June 1, 1937	1,909,746	1,500,000	3,409,746	
Erie.....	2403	843	Jan. 18, 1938	234,933,709	214,868,100	471,811,809	
New Jersey & New York.....	46	36	June 30, 1938	1,012,960	2,228,600	3,241,560	
New York, Susquehanna & Western.....	143	123	June 1, 1937	12,585,908	25,781,163	38,379,071	
Wilkes-Barre & Eastern.....	72	64	Oct. 1, 1937	2,665,000	3,000,000	5,665,000	
Nypano.....	424	424	June 30, 1938	28,000,000	20,000,000	48,000,000	
Florida East Coast.....	685	679	Sept. 1, 1931	57,000,000	37,500,000	95,963,369*	*Includes \$233,369 receiver's certificates issued nominally as collateral for an R. F. C. loan.
Fonda, Johnstown & Gloversville.....	62	58	Apr. 20, 1933	6,140,000	3,000,000	9,140,000	
Fort Smith & Western.....	250	197	June 1, 1931	5,244,000	1,248,000*	6,719,434	*Capital stock represented by 62,400 shares of no par value.
Fort Smith, Subiaco & Rock Island.....	16	16	July 23, 1938	400,000	40,000	440,000	
Georgia & Florida.....	408	363	Oct. 19, 1929	7,446,000	13,382,441*	22,122,162	*Capital stock includes 100,000 shares of no par value.
Georgia, Southwestern & Gulf.....	36	None	Jan. 2, 1933	76,800	14,700	91,500	
Albany & Northern.....	35	35	Jan. 2, 1933	400,000	350,000	750,000	
Louisiana & Northwest.....	99	93	Apr. 1, 1935	2,169,000	2,300,000	4,469,000	
Louisiana Southern.....	15	15	Aug. 2, 1933	200,000	100,000	300,000	
Meridian & Bigbee River.....	50	50	June 15, 1933	500,000	300,000	1,810,000	
Minneapolis & St. Louis.....	1523	1432	July 26, 1923	43,366,051	25,792,600	70,291,151	
Minneapolis, St. Paul & Sault Ste. Marie.....	3232	3188	Dec. 31, 1937	91,315,800	37,810,200	130,108,354	
Missouri Pacific.....	7163	6309	July 1, 1933	385,205,500	154,639,600	552,263,100	
Boonville, St. Louis & Southern.....	0	18	June 1, 1936	250,000	250,000	500,000	
Cairo & Thebes.....	25	25	Dec. 1, 1937	1,699,000	10,000	1,709,000	
Chester & Mount Vernon.....	64	64	Dec. 1, 1937	250,000	250,000	500,000	
Fort Smith Suburban.....	7	7	Dec. 1, 1937	None	46,600	46,600	
Marion & Eastern.....	7	7	Dec. 1, 1937	None	50,000	50,000	
Missouri-Illinois.....	193	134	July 1, 1933	2,737,500	2,250,000	4,987,500	
Missouri Pacific R. R. Corp. in Neb.....	349	349	July 1, 1933	12,735,500	4,000,000	16,735,500	
Natchez & Southern.....	3	3	Dec. 1, 1937	None	250,000	250,000	
New Orleans, Texas & Mexico.....	191	173	July 1, 1933	42,970,000	14,832,900	57,802,900	
Asherton & Gulf.....	32	32	Dec. 1, 1937	200,000	75,000	275,000	
Asphalt Belt.....	18	18	Dec. 1, 1937	None	20,000	20,000	
Beaumont, Sour Lake & Western.....	146	84	July 1, 1933	2,057,825	85,000	2,142,825	
Houston & Brazos Valley.....	43	43	Dec. 1, 1937	1,000,000	422,000	1,422,000	
Houston North Shore.....	27	27	July 1, 1933	850,000	100,000	950,000	
International-Great Northern.....	1155	1101	July 1, 1933	45,750,000	7,500,000	53,974,000	
Austin Dam & Suburban.....	2	2	Dec. 1, 1937	None	100,000	100,000	
New Iberia & Northern.....	104	65	Dec. 1, 1937	2,000,000	1,000,000	3,000,000	
Iberia, St. Mary & Eastern.....	40	40	Dec. 1, 1937	1,000,000	5,000	1,005,000	
Orange & Northwestern.....	62	62	Dec. 1, 1937	1,066,947	35,000	1,101,947	
Rio Grande City.....	21	18	Dec. 1, 1937	None	22,000	22,000	
St. Louis, Brownsville & Mexico.....	602	556	July 1, 1933	12,913,342	500,000	13,877,342	
San Antonio Southern.....	45	29	Dec. 1, 1937	None	250,000	250,000	
San Antonio, Uvalde & Gulf.....	317	314	July 1, 1933	4,413,000	280,000	4,693,000	
San Benito & Rio Grande Valley.....	128	128	Dec. 1, 1937	953,735	70,000	1,023,735	
Sugar Land.....	53	31	Dec. 1, 1937	384,000	250,000	634,000	
Mobile & Ohio.....	1180	905	June 3, 1932	31,022,740*	6,007,200	38,249,940	*Includes \$12,943,740 funded debt matured unpaid.
Nevada Copper Belt.....	30	41	Apr. 2, 1925	622,000	1,000,000	1,622,000	
New York, New Haven & Hartford.....	1882	1303	Oct. 23, 1935	239,552,850	206,155,300	461,111,150	
Hartford & Connecticut Western.....	99	99	July 31, 1936	700,000*	2,967,000	3,667,000	*Matured July 1, 1933, not paid.
Old Colony.....	488	488	June 3, 1936	14,348,000*	25,077,600	39,425,600	*Includes \$4,000,000 funded debt matured unpaid. Does not include funded debt pledged for loans.
Boston & Providence.....	63	63	Aug. 5, 1938	2,170,000*	3,996,000	6,166,000	*Matured July 1, 1938, unpaid.
Providence, Warren & Bristol.....	14	14	Feb. 13, 1937	None	874,600	874,600	
New York, Ontario & Western.....	577	318	May 21, 1937	29,159,417	58,116,243	87,341,660	
Norfolk Southern.....	805	759	July 28, 1932	15,443,345	16,000,000	32,105,345	
Oregon, Pacific & Eastern.....	20	28	Nov. 6, 1937	330,000	200,250	530,250	
Pittsburg, Shawmut & Northern.....	190	156	Aug. 1, 1905	14,655,600	15,000,000	31,699,500	
Rio Grande Southern.....	174	174	Dec. 16, 1929	4,509,000	4,510,000	9,050,000	
Rutland.....	407	393	May 5, 1938	9,216,000	9,080,300	18,406,300	
St. Louis-San Francisco.....	4885	4718	Nov. 1, 1932*	275,429,767	114,701,526	397,462,293	*Changed to trusteeship Oct. 1, 1933.
St. Louis Southwestern.....	1006	745	Dec. 12, 1935	32,233,000	37,079,700	69,903,700	
St. Louis Southwestern of Texas.....	696	661	Dec. 12, 1935	16,044,500	2,750,000*	18,794,500	*Intercompany item.
Stephenville North & South Texas.....	33	33	Dec. 17, 1935	2,423,000*	138,300**	2,561,300	**Exclusive of \$184,000 intercompany item.
Santa Fe, San Juan & Northern.....	32	32	Oct. 14, 1931	.....	500,057	500,057	

Railroads in the Hands of Receivers or Trustees on December 31, 1938—Continued

(For explanation of data bearing symbols see column headed "Remarks")

Road	Mileage operated	Mileage owned or trusteeship	Date of receivership	Funded debt outstanding	Capital stock outstanding	Total old company securities	Remarks
Seaboard Air Line.....	4318	3339*	Dec. 23, 1930	150,801,402**	85,110,662	267,863,946**	*Includes 8.50 miles owned but not operated. **Includes funded debt matured unpaid aggregating \$37,095,902, for the payment of which no provision has been made. "Total old company securities" also includes \$1,738,100 of S. A. L. Ry. equipment obligations which are authorized to be exchanged for receivers' certificates under the Seaboard's 1935 Refunding Plan. *Inclusive of \$67,000 principal amount of Second Mortgage 6% Bonds matured January 15, 1918.
Chesterfield & Lancaster.....	33	32	Apr. 14, 1931	253,000*	500,000	753,000	
East and West Coast.....	Side track		Feb. 2, 1931	624,333	250,000	889,753	
Florida, Western & Northern.....	233		Feb. 2, 1931	14,999,000	5,000	15,170,719	
Georgia, Florida & Alabama.....	192		Nov. 7, 1931	1,750,000	2,010,679*	3,760,679	*Capital stock includes 10,000 shares common of no par value.
Raleigh & Charleston.....	20	20	May 1, 1931	550,000	574,500	1,124,500	
Seaboard All-Florida.....	184		Feb. 2, 1931	17,881,667	2,500	18,011,028	
South Dayton.....	1		Jan. 12, 1937				No other information available.
Spokane International.....	164	139	Aug. 28, 1933	4,200,000	4,200,000	8,400,000	
Coeur D'Alene & Pend D'Oreille.....	21		Aug. 30, 1933	544,000	544,000	1,088,000	
Tallulah Falls.....	57	57	June 25, 1923	1,519,000	323,400	1,842,400	
Virginia & Truckee.....	67	67	Apr. 27, 1938	130,000	5,000,000	5,136,000	
Wabash.....	2410	1949	Dec. 1, 1931	122,311,026	138,120,767	289,219,587	
Ann Arbor.....	294	294	Dec. 4, 1931	9,164,341	7,250,000	16,614,541	
Waco, Beaumont, Trinity & Sabine.....	50	50	Feb. 8, 1930	330,000	1,110,000	1,452,734	
Western Pacific.....	1208	1152	Aug. 2, 1935	49,290,100	75,800,000	138,080,899	
Wichita Northwestern.....	99	99	Nov. 10, 1922	381,750	1,690,000	2,115,750	
Wilmington, Brunswick & Southern.....	30	30	Mar. 17, 1933	90,000	160,000	250,000	
Winchester & Wardensville.....	23	23	June 7, 1938	662,000	134,000	796,000	
Wisconsin Central.....	1140	1002	Dec. 2, 1932	43,759,000*	27,392,200	74,636,200	*Includes \$7,500,000 funded debt matured unpaid.
Yosemite Valley.....	78	78	Dec. 22, 1936	2,318,000	1,448,775	3,766,775	
Yreka Western.....	9	9	Sept. 15, 1935	None	None	16,000	

Summary of Railroad Receiverships and Trusteeships, 1876 to 1938

ROADS PLACED IN RECEIVERSHIP OR TRUSTEESHIP						ROADS TAKEN FROM RECEIVERSHIP OR TRUSTEESHIP *						ROADS PLACED IN RECEIVERSHIP OR TRUSTEESHIP						ROADS TAKEN FROM RECEIVERSHIP OR TRUSTEESHIP *					
Year	Number of roads	Miles	Bonds and stocks	Number of roads	Miles	Bonds and stocks	Year	Number of roads	Miles	Bonds and stocks	Year	Number of roads	Miles	Bonds and stocks	Number of roads	Miles	Bonds and stocks						
1876...	42	6,662	\$467,000,000	30	3,840	\$217,848,000	1906...	6	204	\$55,042,000	1906...	6	204	\$55,042,000	8	262	\$10,400,000						
1877...	38	3,637	220,294,000	54	3,875	198,984,000	1907...	7	317	13,585,000	1907...	7	317	13,585,000	6	114	13,777,000						
1878...	27	2,320	92,385,000	48	3,906	311,631,000	1908...	24	8,009	596,359,000	1908...	24	8,009	596,359,000	3	138	2,547,000						
1879...	12	1,102	39,367,000	65	4,909	243,288,000	1909...	5	859	78,095,000	1909...	5	859	78,095,000	12	2,629	250,033,000						
1880...	13	885	140,265,000	31	3,775	263,882,000	1910...	7	735	51,427,500	1910...	7	735	51,427,500	17	1,100	93,660,109						
1881...	5	110	3,742,000	29	2,617	137,923,000	1911...	5	2,606	210,606,882	1911...	5	2,606	210,606,882	13	1,386	40,741,543						
1882...	12	912	39,074,000	16	867	65,426,000	1912...	13	3,784	182,112,497	1912...	13	3,784	182,112,497	12	661	25,910,990						
1883...	11	1,990	108,470,000	18	1,354	47,100,000	1913...	17	9,020	477,780,820	1913...	17	9,020	477,780,820	6	1,159	86,163,850						
1884...	37	11,038	714,755,000	15	710	23,504,000	1914...	22	4,222	199,571,446	1914...	22	4,222	199,571,446	9	1,470	83,189,500						
1885...	44	8,836	385,460,000	22	3,156	278,394,000	1915...	12	20,143	1,070,808,628	1915...	12	20,143	1,070,808,628	11	3,914	285,258,782						
1886...	13	1,799	70,346,000	45	7,687	374,109,000	1916...	9	4,439	208,159,689	1916...	9	4,439	208,159,689	26	8,355	703,444,855						
1887...	9	1,046	90,318,000	31	5,478	328,181,000	1917...	19	2,486	61,169,962	1917...	19	2,486	61,169,962	20	10,963	557,846,348						
1888...	22	3,270	186,814,000	19	1,596	64,555,000	1918...	8	3,519	242,090,800	1918...	8	3,519	242,090,800	11	763	24,735,187						
1889...	22	3,803	99,664,000	25	2,930	137,815,000	1919...	7	244	11,886,779	1919...	7	244	11,886,779	8	459	15,479,587						
1890...	26	2,963	105,007,000	29	3,825	182,495,000	1920...	10	541	21,620,150	1920...	10	541	21,620,150	7	380	7,676,200						
1891...	26	2,159	84,479,000	21	3,223	169,069,000	1921...	14	1,744	63,872,113	1921...	14	1,744	63,872,113	11	4,173	306,123,942						
1892...	36	10,508	357,692,000	28	1,922	95,898,000	1922...	12	4,330	329,114,860	1922...	12	4,330	329,114,860	15	6,151	299,491,646						
1893...	74	29,340	1,781,046,000	25	1,613	79,924,000	1923...	10	2,218	87,913,581	1923...	10	2,218	87,913,581	8	637	14,622,900						
1894...	38	7,025	395,791,000	42	5,643	318,999,000	1924...	11	920	30,223,372	1924...	11	920	30,223,372	14	3,992	269,251,082						
1895...	31	4,089	369,075,000	52	12,831	761,791,000	1925...	6	11,368	680,422,080	1925...	6	11,368	680,422,080	6	638	9,965,000						
1896...	34	5,441	275,597,000	58	13,730	1,150,377,000	1926...	6	88	2,821,400	1926...	6	88	2,821,400	12	12,852	626,662,708						
1897...	18	1,537	92,909,000	42	6,675	517,680,000	1927...	6	924	45,236,674	1927...	6	924	45,236,674	5	142	4,254,000						
1898...	18	2,069	138,701,000	47	6,054	252,910,000	1928...	1	19	529,000	1928...	1	19	529,000	4	209	6,393,250						
1899...	10	1,019	52,285,000	32	4,294	267,534,000	1929...	3	634	30,981,391	1929...	3	634	30,981,391	5	562	20,715,065						
1900...	16	1,165	78,234,000	24	3,477	190,374,000	1930...	4	4,752	277,323,994	1930...	4	4,752	277,323,994	2	1,048	124,668,500						
1901...	4	73	1,627,000	17	1,139	85,808,000	1931...	19	5,195	432,151,526	1931...	19	5,195	432,151,526	2	102	993,860						
1902...	5	278	5,835,000	20	693	39,788,000	1932...	13	11,817	626,577,314	1932...	13	11,817	626,577,314	8	394	8,575,178						
1903...	9	229	18,823,000	13	555	15,885,000	1933...	18	21,222	1,229,678,183	1933...	18	21,222	1,229,678,183	2	298	16,133,000						
1904...	8	744	36,069,000	13	524	28,266,000	1934...	1	81	460,000	1934...	1	81	460,000	2	40	1,598,600						
1905...	10	3,593	176,321,000	6	679	20,307,000	1935...	16	29,018	2,182,979,167	1935...	16	29,018	2,182,979,167	5	436	9,146,800						
							1936...	4	8	43,026,400	1936...	4	8	43,026,400	3	122	7,507,961						
							1937...	23	1,937	186,136,861	1937...	23	1,937	186,136,861	2	179	5,455,810						
							1938...	9	6,194	660,997,669	1938...	9	6,194	660,997,669	8	290	.....					

* Prior to 1938 these figures covered foreclosure sales only.

on its preferred stock, the last previous payment having been \$1.50 in December, 1937. The Louisville & Nashville made two payments aggregating \$4; in 1937 it paid \$6.

The Pennsylvania paid 50 cents in 1938, as contrasted with total payments of \$1.25 in 1937. The Reading Company in October reduced its quarterly payment to 25 cents from the 50 cents it had been paying previously.

Owed to Uncle Sam

The status of railroad indebtedness to the Reconstruction Finance Corporation, as of November 30, 1938, is shown in an accompanying table. The net debt to this government corporation as of that date was \$422,541,377, representing an increase of \$66,618,362 in the twelve months since the end of November, 1937. These figures

do not include government loans for the financing of equipment purchases. Including equipment loans, the net loans of the government to the railroads on November 30 stood at \$575,655,093. The government had, however, disposed of \$106,497,000 of its equipment loans to private investors (at a profit of almost \$5,000,000)—leaving the total indebtedness to the government at \$469,158,093 on November 30, 1938.

The Railroad Credit Corporation at the end of November had liquidated approximately 77½ per cent of the approximately \$75,000,000 of advances which it had received from the railroads under the "marshaling and distributing plan."

31 Per Cent of Roads in Courts' Hands

Data on the railroads in receivership are given in customary detail in tables herewith. Receiverships or trusteeships were established for three major railroad properties during the year, while no large companies heretofore under the jurisdiction of the courts were removed therefrom. As Dr. Julius Parmelee states in his article elsewhere in this issue, the 111 companies now in the hands of the courts, representing approximately 78,000 miles of line, constitute about 31 per cent of the railroad mileage of the country—a new high figure. It is to be noted, moreover, that, except for efforts being made to effect voluntary readjustments of their indebtedness, quite likely two or more additional carriers would by now have joined this group.

Equipment Prices

THE available evidence on the prices of rolling stock and motive power continues meager and of little significance. The primary reason is, of course, the relatively small volume of buying—and the preponderance of orders in small lots. Added to that is the fact that price data are made available only upon the granting of authority by the Interstate Commerce Commission for the issuance of equipment trust certificates—and the unit prices of specific pieces of equipment are not always disclosed. Moreover, at such a time as this of wide experiment and the consequent installation of specialized experimental equipment, the prices which are disclosed are not in all cases truly representative of genuine trends.

With these limitations in mind, however, the data are worthy of record, as the only evidence available on an

Prices of Some of 1938's Passenger Cars

No.	Type	Length	Construction	Weight Lb.	Unit Price
1	Bagg.-Mail	74 ft. 5½ in.	Steel	96,000	\$35,970
4	Taproom-Bagg.	82 ft. 2½ in.	Steel	98,800	34,510
4	Dining	82 ft. 2½ in.	Steel	105,400	44,060
6	Parlor	82 ft. 2½ in.	Steel	93,300	39,150
4	Parlor	82 ft. 2½ in.	Steel	91,700	40,050
15	Coach	82 ft. 2½ in.	Steel	93,400	36,410
2	Mail	63 ft. 10½ in.	Steel	90,100	28,000
20	Coach	84 ft. ¼ in.	Steel	108,000	40,220
30	Coach	84 ft. ¼ in.	Steel	108,000	41,520
2	Coach	84 ft. 6 in.	Steel	105,000	70,500
6	Bagg.-Exp.	70 ft. 0 in.	Steel	.....	22,087
2	Bagg.-Mail-Exp.	73 ft. 10 in.	Lt. Weight	.....	60,969
2	Club-Bagg.	79 ft. 10 in.	Lt. Weight	.....	81,740
1	Club-Lounge	79 ft. 10 in.	Lt. Weight	.....	83,690
1	Dining	83 ft. 2 in.	Lt. Weight	.....	82,513
2	Dining	83 ft. 2 in.	Lt. Weight	.....	83,019
2	Bagg.-Chair-Dorm.	79 ft. 10 in.	Lt. Weight	.....	82,890
2	Bagg.-Chair	79 ft. 10 in.	Lt. Weight	.....	77,657
2	Lunch-Dining	83 ft. 2 in.	Lt. Weight	.....	83,690
2	Chair-Obs.	80 ft. 0 in.	Lt. Weight	.....	82,957
2	Chair-Club	79 ft. 10 in.	Lt. Weight	.....	83,180
3	Tavern-Lounge	83 ft. 2 in.	Lt. Weight	.....	82,190
5	Tavern-Obs.	80 ft. 0 in.	Lt. Weight	.....	79,690
17	Chair	79 ft. 10 in.	Lt. Weight	.....	64,157

Partial List of 1938 Locomotive Prices

No.	Type	Service	Weight lb.	Tractive Force—lb. or h.p.	Unit Price
2	Diesel-Elec.	Psgr.	565,000	3600 h.p.	\$380,143
2	Diesel-Elec.	Psgr.	285,000	1800 h.p.	192,097
3	Diesel-Elec.	Psgr.	285,000	1800 h.p.	187,504
4	4-6-4	Psgr.	415,000	50,300 lb.	164,500
6	Elec.	Psgr.	432,000	3600 h.p.	297,489
6	Diesel-Elec.	Sw.	190,200	600 h.p.	64,750
20	Elec.	Psgr.	460,000	4620 h.p.	268,000
6	4-8-4	Psgr.	410,000	62,800 lb.	142,500
6	Diesel-Elec.	Psgr.	308,495	1800 h.p.	185,003
3	Diesel-Elec.	Psgr.	298,960	1800 h.p.	175,000

Some of 1938's Freight Car Prices

No.	Type	Construction	Capacity Lb.	Unit Price
500	Box	Steel	80,000	\$2,842
115	Hopper	Steel	140,000	3,100
50	Rack	Steel	100,000	2,863
50	Flat	Steel	100,000	2,253
1000	Gondola	Steel	140,000	2,876
6	Well-Flat	Steel	250,000	9,000
2	Flat	Steel	400,000	12,500
2000	Box	Steel Sheath	80,000	2,456
1000	Box	Steel Sheath	80,000	2,454
200	Furniture	Steel Sheath	100,000	3,075
50	Gondola (Mill)	Steel	140,000	3,776
1250	Gondola (H. Side)	Steel	100,000	2,282
700	Gondola (L. Side)	Steel	100,000	2,092
250	Stock	Composite	80,000	2,368
100	Flat	Steel	140,000	3,100

aspect of the railroad economy which is of considerable importance. The information, as made available in I. C. C. orders permitting the issuance of equipment trust certificates, appears in accompanying tables—in some cases supplemented by descriptive details from other sources. In addition to the equipment noted in these tables, there is a record also of the purchase of 4 Diesel-electric trains (two cars each—one a mail, baggage and power car and the other a coach), costing \$133,900 per train.

* * *



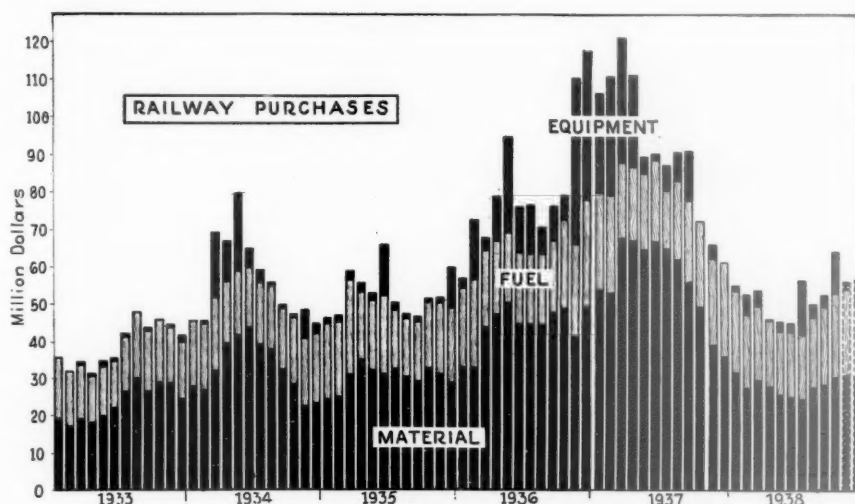
One of the New Twentieth Century Limiteds with an Attractive Scenic Background

Less Buying By Railroads in 1938

Purchases now increasing after 55 per cent decline—More materials used than bought—Deferred buying mounts

By D. A. Steel

Purchases and Stores Editor

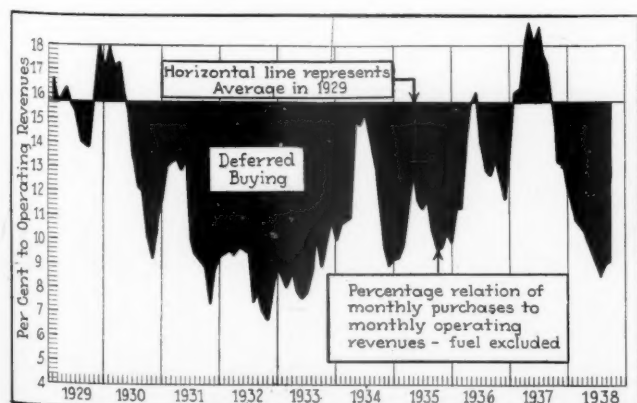


Ups and Downs in Railway Purchases January, 1933, to December, 1938

AS nearly as can be determined at this time with incomplete records for November and December, railway buying has been gradually expanding for several months and more materials are being consumed than purchased. The upturn in total buying, however, was not large enough to do more than to arrest the prolonged decline that has occurred since June, 1937, with the result that purchases in 1938, while representing an imposing sum in the aggregate, were only half as large as in 1937 and reflected the smallest volume of buying in five years.

\$633,000,000 in 1938

In this review, the purchases of fuel, rails, ties and other material were computed from reports made to this paper each month by most of the Class I railroads. Lesser divisions of the purchases of material were computed from details furnished by 30 railroads and the purchases of rolling stock were computed from this paper's week to week records of orders placed by the railroads with car and locomotive builders.



Changes in the Ratio of Purchases to Operating Revenues January, 1929, to November, 1938. Low Blacks show where the Railroad spent more per Dollar of Revenue than in 1929. High Blacks show Where they Spent More. The Difference is Deferred Buying

Purchases of materials, equipment and fuel totaled approximately \$633,111,000 in 1938, including approximately \$340,323,000 of rail, ties and other materials received from manufacturers and \$53,807,000 of new cars and locomotives ordered from equipment builders—a combined total of approximately \$394,130,000 of materials and equipment from manufacturers, while the remaining \$238,981,000 went for fuel. The total includes freight paid for transportation on foreign lines but excludes heat, light, water, power and services and also materials furnished by contractors of railway construction. Materials for equipment built in railroad shops are for the most part included in the purchases of materials.

The best information available at this time indicates that the totals included about \$15,809,000 of rails, about \$38,443,000 of crossties, over \$17,370,000 of timber and lumber, about \$6,414,000 of bar and sheet steel, \$20,340,000 of car and locomotive castings, \$21,708,000 of wheels, tires, and axles and approximately \$16,718,000 of lubricating and illuminating oils and other oil house materials. Other details are tabulated.

Purchases for maintenance of way totaled approximately \$120,618,000 last year, purchases for maintenance of equipment totaled approximately \$121,863,000 and materials for trains and stations and for conducting transportation, exclusive of fuel, totaled approximately \$97,842,000.

\$476,592,000 Less from Manufacturers

Materials received from manufacturers last year, including materials for equipment to be built in railroad shops, were less by approximately \$357,079,000 or 51 per cent than the corresponding purchases in 1937, were less by approximately \$215,518,000 or 39 per cent than the corresponding purchases in 1936, and were less than in any previous year of record with the exceptions of 1932 and 1933. Compared with 1929, the purchases of materials from manufacturers in 1938 \$651,472,000 or 65 per cent.

The value of equipment ordered from builders of

Annual Purchases—Supplies and Equipment—Class I Roads

	Materials received from man'f't's (000)	Equipment ordered from man'f't's (000)	Total from man'f't's (000)	Fuel* (000)	Total including fuel (000)
1929...	\$991,795	\$397,121	\$1,388,916	\$336,805	\$1,725,721
1930...	727,223	146,471	873,694	308,277	1,181,971
1931...	451,651	28,873	480,524	243,349	723,873
1932...	268,100	2,623	270,723	177,000	447,723
1933...	266,846	5,857	272,703	180,904	453,607
1934...	395,012	66,850	461,862	209,488	671,350
1935...	365,830	35,696	401,526	228,720	630,246
1936...	555,841	222,594	778,435	266,463	1,044,898
1937...	697,402	173,320	870,722	282,366	1,153,088
1938...	340,323	53,807	394,130	238,981	633,111

* Coal and fuel oil.
Subject to revision.

locomotives and cars last year, while exceeding the totals of 1932 to 1935, inclusive, were less by approximately \$119,787,000 or 69 per cent than in 1937 and they were less by approximately \$168,787,000 or 76 per cent in dollar value than in 1936. They were only one-eighth as large as the corresponding purchases of equipment in 1929. These expenditures for equipment represent the value of cars and locomotives ordered during the year and are therefore to be distinguished from capital expenditures for equipment, which deal only with equipment installed and also include the labor charges on equipment built in railroad shops.

The combined purchases of materials and equipment from manufacturers last year were less by approximately \$475,692,000 or 55 per cent than in 1937; they were less by approximately \$384,305,000 or 49 per cent than in 1936 and they showed a decline from the purchases in 1929 of 72 per cent.

Dollar for dollar the combined purchases of materials, equipment and fuel in 1938 showed a decline of approximately \$519,977,000 or 45 per cent from 1936 and they were less by approximately \$1,092,610,000 or 63 per cent than the corresponding purchases in 1929.

Railway expenses last year naturally included interest installments on materials and equipment purchased with borrowed money or under leasing contracts in the years prior to 1938. In 1936 and 1937 moreover, as will be discussed in more detail later, the railroads accumulated approximately \$100,000,000 of materials and supplies

which they did not use. To an extent, therefore, the decline in purchases of materials last year and in commitments for equipment reflected logical adjustments in railway spending. However, the purchases of materials from manufacturers, after having increased to \$67,000,000 per month in March, 1937, for the first time since 1929, declined precipitously for 15 months to a low of \$25,000,000 in June, 1938, which had only been equalled once since June, 1933.

Only three Class I railroads purchased more materials in the first 10 months of 1938 than in the corresponding period of 1937 and these purchases were reduced more than 40 per cent by 35 railroads. The reductions were 53 per cent on the Santa Fe; 65 per cent on the Baltimore & Ohio; 29 per cent on the Chesapeake & Ohio; and 48 per cent on the North Western. The decline was 56 per cent on the Burlington; 20 per cent on the Rock Island; 46 per cent on the Delaware, Lackawanna & Western; 38 per cent on the Great Northern; 31 per cent on the Illinois Central; and 37 per cent on the Louisville & Nashville. The decline was 41 per cent on the Missouri Pacific; 47 per cent on the New York Central; 60 per cent on the Pennsylvania;

Materials On Hand—November 1, 1938

	Fuel (000)	Rail, New & S.H. (000)	Crossties (000)	Other Material (000)	Scrap (000)	Total (000)
Jan. 1, 1938 ...	\$30,499	\$30,333	\$59,015	\$255,713	\$9,495	\$385,055
Feb. 1, 1938 ...	31,453	31,820	66,153	245,887	8,075	383,388
Mar. 1, 1938 ...	28,822	32,238	68,558	244,454	7,979	382,051
Apr. 1, 1938 ...	27,847	34,644	73,280	236,512	8,098	380,381
May 1, 1938 ...	25,223	34,076	71,583	235,876	7,336	374,094
June 1, 1938 ...	22,391	33,504	65,020	233,634	9,396	363,945
July 1, 1938 ...	22,568	33,007	63,271	227,136	9,276	355,258
Aug. 1, 1938 ...	20,665	32,238	60,900	222,646	8,944	345,393
Sept. 1, 1938 ...	23,192	30,452	62,935	214,662	6,271	337,511
Oct. 1, 1938 ...	23,376	28,934	58,968	212,698	5,910	329,887
Nov. 1, 1938 ...	21,265	26,893	54,700	218,887	8,131	329,876
Nov. 1, 1937 ...	28,411	31,769	53,040	262,604	8,552	384,376

Subject to revision.

47 per cent on the Reading; 31 per cent on the Southern Pacific; and 53 per cent on the Union Pacific.

Buying Turns Up

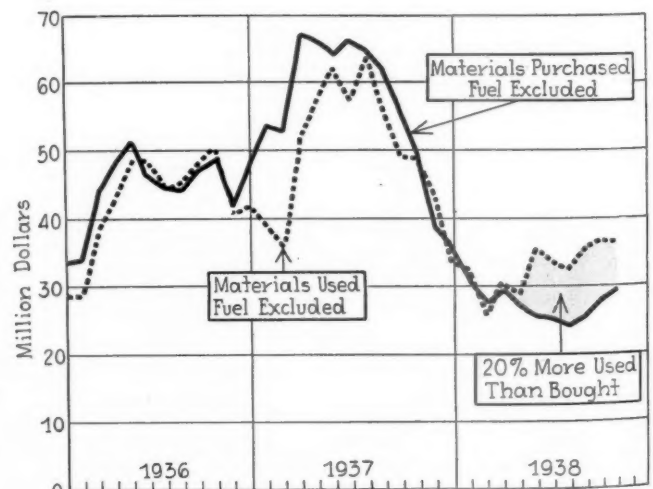
Railway buying is now increasing again. Purchases of materials from manufacturers were \$3,200,000 larger

Purchases of Material and Supplies—Class I Roads

	Fuel		Rail		Crossties	
	1938 (000)	1937 (000)	1938 (000)	1937 (000)	1938 (000)	1937 (000)
January	\$21,879	\$26,054	\$1,379	\$3,128	\$3,962	\$3,923
February	20,027	26,328	1,647	3,858	3,808	3,399
March	19,953	30,644	1,743	6,224	3,975	4,985
April	18,413	19,583	1,732	5,343	3,539	5,107
May	17,113	20,516	1,769	5,009	3,597	5,029
June	17,334	22,463	1,785	5,764	3,323	6,017
July	17,189	21,873	1,287	3,813	3,099	5,703
August	18,663	21,234	1,270	2,787	2,852	6,027
September	20,034	22,237	1,040	2,702	2,921	5,667
October	22,376	23,181	657	1,542	2,867	4,517
November	23,000	23,405	1,000	897	2,500	3,805
December	23,000	24,848	500	1,204	2,000	4,049
12 Mos.	238,981	282,366	15,809	42,271	38,443	58,228

	Other Material		Total		Total Less Fuel	
	1938 (000)	1937 (000)	1938 (000)	1937 (000)	1938 (000)	1937 (000)
January	\$26,007	\$46,862	\$53,227	\$79,967	\$31,348	\$53,913
February	21,159	45,415	47,241	79,000	27,214	52,672
March	23,073	55,942	49,844	97,795	29,891	67,151
April	20,763	56,536	45,452	86,659	27,039	66,986
May	19,432	54,051	42,911	84,605	25,798	64,089
June	19,057	54,591	42,499	88,835	25,165	66,372
July	17,753	55,091	41,928	86,480	24,739	64,607
August	23,206	52,872	46,591	82,920	27,928	61,686
September	25,017	47,038	49,012	77,644	28,978	55,407
October	27,199	43,038	53,099	72,278	30,723	49,097
November	27,500	34,024	54,000	62,131	31,000	38,726
December	28,000	30,610	53,500	60,711	30,500	35,863
12 Mos.	278,166	576,070	579,304	958,935	340,323	676,569

Subject to revision.



Materials Purchased and Consumed by Class I Railroads January, 1936, to November, 1938. Consumption Exceeded Purchases in 1938 and was \$11,000,000 Higher in October and in February

in August than in July, \$1,000,000 larger in September than in August and \$2,000,000 larger in October than

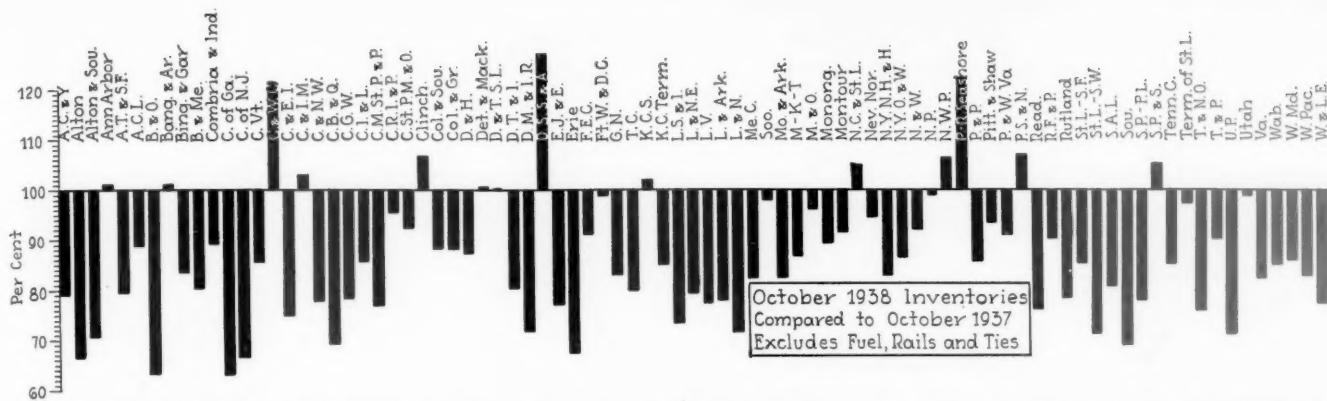


Chart showing the Proportionate Increase or Decrease in Material on Hand from October 31, 1937, to October 31, 1938. Most Railroads Reported Declines of 5 to 35 per cent

in September. It appears also that larger purchases were made in November and December than in October. Purchases of material, exclusive of rails, ties and fuel last October and November were larger than in any previous month in 1938 and were larger by \$11,000,000 or 50 per cent each month than in July. The purchases of material and equipment, exclusive of fuel, from manufacturers during the last six months of 1938 exceeded the corresponding purchases in the first six months of 1938 by approximately \$31,640,000 or 17 per cent and the value of orders placed for rolling stock in the second half of 1938 was two and one-half times the corresponding purchases of equipment in the first half of the year.

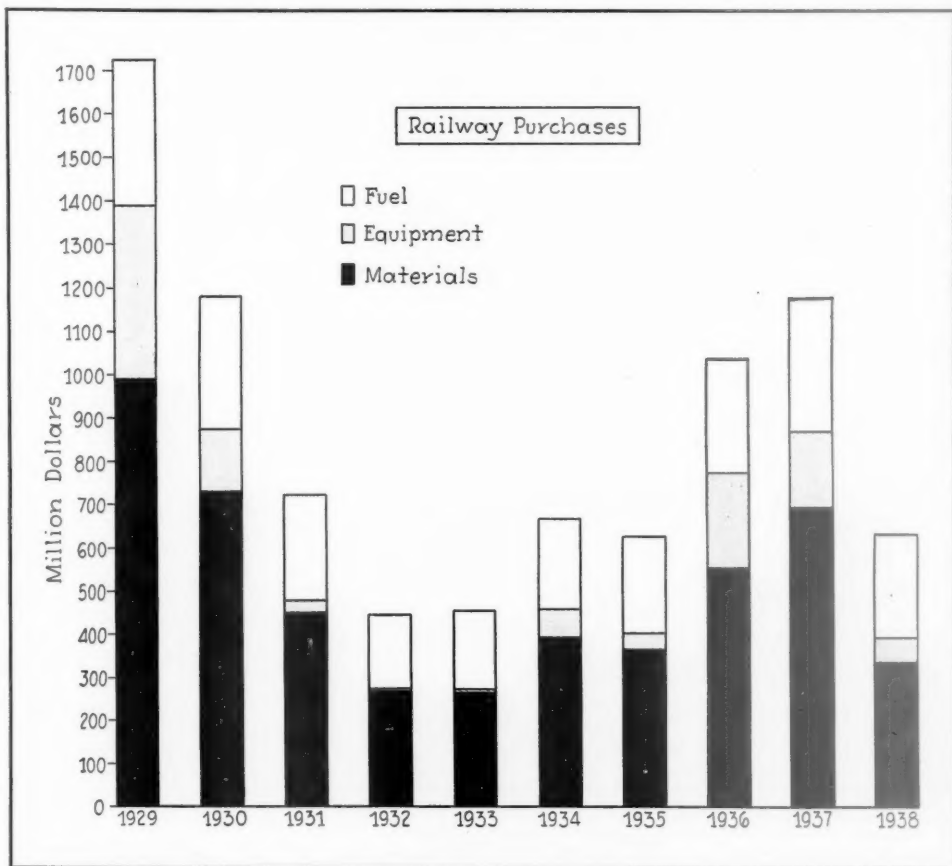
Less Material On Hand

While purchases were declining, railway inventories also declined. On November 1 the railroads had approximately \$26,893,000 of new and second hand rail

in stock. This was \$4,856,000 less than on November 1, 1937, and \$7,751,000 less than on May 1, 1938, when rail stocks were at their highest. Crosstie stocks on November 1, totaling \$54,700,000, were slightly higher than on November 1, 1937, but were \$16,883,000 lower than on April 1 when crosstie stocks were highest. Unapplied storehouse materials, including materials for repairs to locomotives and cars, totaled \$218,887,000 on November 1, 1938,—a reduction of \$43,717,000 from November 1, 1937, and a reduction of \$36,826,000 from January 1, 1938. The net reduction in materials on hand, exclusive of fuel, from January 1, 1938, to November 1, 1938, was approximately \$45,581,000.

All but 8 roads reported less repair materials on hand on November 1, 1938, than on November 1, 1937, and 28 reported reductions in excess of 20 per cent. As compared with November 1, 1937, the inventories on November 1, 1938, showed reductions of 20.5 per cent on the Santa Fe, 37 per cent on the Baltimore & Ohio, 22 per cent on the North Western, 33 per cent

Annual Purchases — Class I Railroads, 1929-1938



on the Burlington, 17 per cent on the Great Northern, 20 per cent on the Illinois Central, 22 per cent on the Southern Pacific and 28 per cent on the Union Pacific.

During 1938 the railroads were thus using material faster than they were buying it. As shown in one of the charts, the consumption of material increased each month last year from February, 1938, and 20 per cent more material was used during the first 10 months of 1938 than was purchased in the same period. Total inventories of the Class I railroads were only \$48,000,-

Materials On Hand					Purchases of Material and Fuel—10 Months				
Road	Rail—New and S. H.		Cross Ties		Other Material—Less Fuel		Road	1938	Per Cent of Operating Revenues
	Oct. 31, 1938	Per Mile	Oct. 31, 1938	Per Mile	Oct. 31, 1938	12 Mos. Decrease Per Cent			
A. C. & Y.....	\$ 9,161	53	\$ 12,743	75	\$ 60,948	21.0	A. C. & Y.....	\$ 218,151	16.1
Alton.....	85,839	90	162,728	170	438,143	33.6	Alton.....	2,423,612	18.9
Alton & Sou.....	9,826	...	2,112	...	47,177	29.5	Alton & Sou.....	192,791	...
Ann Arbor.....	8,892	...	17,946	...	169,151	+1.0	Ann Arbor.....	526,782	18.5
A. T. & S. F.....	2,939,757	218	7,146,853	530	10,232,833	20.5	A. T. & S. F.....	21,699,052	17.0
A. B. & C.....	7,083	10	90,138	140	204,088	...	A. B. & C.....	629,108	22.4
A. C. L.....	707,029	138	618,273	121	1,923,929	6.5	A. C. L.....	9,080,681	24.5
B. & O.....	940,325	146	721,984	112	6,154,473	40.5	B. & O.....	12,244,800	11.1
Bang. & Aroos.....	63,317	105	152,126	250	574,531	+1	Ban. & Aroos.....	1,272,914	26.8
Bing. & Gar.....	5,120	...	8,640	...	41,613	16.5	B. & L. E.....	1,022,684	14.9
Bost. & Me.....	243,053	125	761,694	390	1,956,629	19.3	Bing. & Gar.....	87,093	...
Cam. & Ind.....	3,847	104	4,270	115	37,966	10.7	B. & Me.....	4,479,479	13.6
Cent. of Ga.....	4,113	2	317,322	165	647,483	37.0	Burl.-R. I.....	124,383	10.3
Cent. of N. J.....	181,768	256	253,234	360	989,594	33.0	Cambria & I.....	109,806	11.5
Cent. Vt.....	42,944	97	141,320	320	350,363	14.4	Cent. of Ga.....	2,306,733	18.6
Char. & Wes. C.....	15,021	44	39,588	115	133,337	+1.0	Cent. of N. J.....	4,224,543	17.4
C. & O.....	...	...	...	...	4,113,582	11.5	Cent. Vt.....	966,681	23.6
C. & E. I.....	227,569	245	191,544	205	502,368	25.0	Char. & W. C.....	500,836	28.0
C. & I. M.....	24,477	186	14,695	112	273,426	+3.0	C. & O.....	11,969,165	13.7
C. & N. W.....	1,025,710	122	3,040,181	362	5,457,351	24.0	C. & E. I.....	1,791,361	15.4
C. B. & Q.....	746,618	83	2,295,511	250	4,480,577	32.7	C. & I. M.....	427,714	14.9
C. G. W.....	9,660	6	4,119	3	428,758	41.6	C. & N. W.....	11,777,483	17.5
C. I. & L.....	107,271	195	143,113	262	605,363	14.5	C. B. & O.....	11,944,253	15.6
C. R. I. & P.....	467,337	57	1,214,430	151	5,126,184	4.5	C. G. W.....	3,081,207	21.9
C. St. P. M. & O.....	265,947	162	406,404	247	805,063	13.0	C. I. & L.....	852,846	12.5
Clinchfield.....	96,355	312	112,765	362	271,812	+6.5	C. R. I. & P.....	15,056,675	23.2
Colo. & Sou.....	69,788	88	81,870	102	211,180	11.7	C. St. P. M. & O.....	3,058,788	22.0
Col. & Gr.....	8,907	53	2,229	14	116,253	11.5	Clinch.....	893,892	18.5
D. & H.....	123,688	148	301,169	364	1,445,982	12.5	Colo. & Sou.....	1,016,982	19.0
D. L. & W.....	112,958	112	238,195	238	1,242,285	...	Colum. & Gre.....	181,052	18.2
D. & R. G. W.....	735,763	286	321,345	124	2,551,171	+1.0	D. & H.....	2,136,357	12.3
Det. & Mack.....	14,978	62	16,667	68	137,857	...	D. & R. G. W.....	3,706,872	19.6
D. & T. S. L.....	5,938	118	16,017	320	71,583	...	D. L. & W.....	4,507,838	12.5
D. T. & I.....	58,361	124	121,736	260	299,945	19.5	Det. & Mack.....	126,686	17.5
D. M. & I. R.....	148,042	275	374,550	695	541,010	28.1	D. & T. S. L.....	199,282	9.8
D. S. S. & A.....	38,526	68	49,825	90	136,202	+28.5	D. T. & I.....	491,721	12.3
E. J. & E.....	89,047	202	118,068	272	733,879	23.0	D. M. & I. R.....	1,068,001	12.4
Erie.....	231,143	94	784,088	320	1,785,182	32.5	D. S. S. & A.....	361,015	22.9
F. E. C.....	328,933	480	61,251	90	1,216,864	8.5	E. J. & E.....	1,054,429	11.4
Fl. W. & D. C.....	32,696	36	25,781	27	395,000	1.0	Erie.....	9,803,043	9.6
Gr. Nor.....	777,102	96	934,450	116	4,927,280	17.0	F. E. C.....	1,340,407	16.7
I. C.....	30,053	4	463,312	68	5,786,330	20.0	Fl. W. & D. C.....	1,279,985	23.4
K. C. S.....	121,421	138	274,718	312	608,851	0.0	Gr. Nor.....	12,003,568	18.1
K. C. T.....	5,690	...	42,032	...	122,590	14.5	I. C.....	15,460,971	17.7
L. S. & I.....	51,799	332	24,455	143	124,131	26.7	K. C. S.....	1,548,571	14.1
L. & N. E.....	49,480	238	37,329	180	162,271	20.5	K. C. Term.....	622,723	...
Lehigh Val.....	190,942	147	326,156	250	1,748,462	22.5	L. S. & I.....	118,657	12.2
L. & Ark.....	28,252	47	36,946	61	416,125	22.0	L. & N. E.....	360,569	12.9
L. & N.....	590,105	119	2,111,127	425	4,446,028	30.0	L. V.....	5,377,202	15.9
Me. Cent.....	168,696	168	183,697	183	837,792	17.5	La. & Ark.....	948,556	18.7
M. & St. L.....	94,547	62	82,030	53	486,068	...	L. & N.....	9,466,362	14.6
Soo.....	148,603	34	232,457	54	1,225,430	2.5	Me. C.....	2,011,982	21.8
Mo. & Ark.....	1,737	5	1,922	5	43,189	17.7	Soo.....	4,199,207	20.4
M-K-T.....	64,520	20	268,373	82	1,558,500	13.0	Mo. & Ark.....	173,395	21.0
M. & O.....	24,830	20	12,568	10	737,545	14.5	M-K-T.....	3,266,081	14.0
Monong.....	10,404	61	17,046	100	168,077	10.5	M. & O.....	18,699,293	20.8
Montour.....	13,745	250	606	10	128,277	8.7	Monong.....	1,404,365	14.6
N. C. & St. L.....	141,981	127	299,822	268	1,058,207	+5.0	Montour.....	183,383	6.8
Nev. Nor.....	10,213	60	12,293	75	67,790	5.0	N. C. & St. L.....	1,820,258	16.1
N. Y. C. Sys.....	2,033,521	178	4,248,761	375	22,501,662	10.5	Nev. Nor.....	83,209	18.1
N. Y. C. & St. L.....	...	...	...	...	1,700,289	19.5	N. Y. C.....	39,784,999	15.7
N. Y. O. & W.....	410,558	208	729,484	250	3,373,715	17.0	N. Y. C. & St. L.....	4,900,853	16.5
Nor. & Wes.....	21,106	37	16,836	29	374,024	13.5	N. Y. O. & W.....	9,357,234	15.1
Nor. Pac.....	719,017	338	819,733	370	4,858,531	8.0	N. Y. C. & W.....	1,041,699	19.4
Northwest Pac.....	362,677	58	1,616,898	258	6,465,012	1.0	Nor. Pac.....	10,931,209	23.2
Penna. & L. I.....	57,302	162	64,667	182	85,838	46.0	Nor. West. Pac.....	455,713	17.7
Penna. & L. I.....	2,735,924	256	4,402,581	415	25,653,866	31.0	Penna.-Long Is.....	35,810,841	11.4
Pa.-R. S. S. L.....	31,004	75	3,139	8	79,264	30.0	P.-R. Seashore.....	360,165	7.9
P. & P. U.....	9,973	...	7,238	...	74,696	14.2	P. & P. U.....	240,217	...
Pere Marq.....	...	...	...	...	1,586,229	21.0	P. M.....	4,260,940	20.5
Pitt. & Shaw.....	12,672	125	28,559	285	79,298	6.5	P. & S.....	85,470	22.2
Pitts. & W. Va.....	48,028	354	19,827	145	440,015	9.0	P. S. & Nor.....	93,038	13.2
Pitts. S. & Nor.....	14,889	79	5,648	30	56,221	47.0	Pitt. & W. V.....	412,549	27.7
Reading.....	535,590	370	614,698	425	3,627,171	23.0	Read.....	5,444,018	13.7
R. F. & P.....	...	...	...	...	702,478	10.0	R. F. & P.....	1,402,240	22.0
Rutland.....	...	...	...	...	183,841	70.5	Rutland.....	534,826	22.0
St. L.-S. F.....	395,735	77	1,135,699	225	3,057,590	14.5	St. L.-S. F.....	8,050,003	21.6
St. L. S. W.....	190,293	117	247,226	145	801,290	29.0	St. Louis. So. W.....	2,252,366	14.7
S. A. L.....	515,081	112	427,274	98	2,786,602	19.0	S. A. L.....	6,591,748	20.1
Southern.....	259,315	32	1,223,031	152	3,996,004	29.5	Sou.....	15,975,774	16.6
S. P.-P. Sys.....	948,035	109	1,858,829	212	6,019,920	22.0	S. P.-P. L.....	23,092,088	18.4
S. P. & S.....	55,262	59	78,745	83	511,759	+5.0	S. P. & S.....	1,135,439	16.5
Tenn. Cent.....	...	...	6,000	20	230,189	14.5	Spok. Int'l.....	86,366	13.6
Term. of St. L.....	32,679	...	12,512	...	338,608	2.5	Tenn. Cent.....	284,703	15.2
T. & N. O.....	583,762	131	745,357	168	1,986,544	24.0	Term. of St. L.....	1,207,209	...
Tex. & Pac.....	281,584	145	339,778	175	2,222,754	9.5	T. & P.....	3,471,865	15.9
U. P. Sys.....	1,461,886	148	2,890,082	290	16,106,904	28.2	T. & N. O.....	5,407,650	15.6
Utah.....	44,097	440	59,753	530	158,636	1.0	U. P.....	20,567,818	16.8
Va.....	81,062	127	426,936	670	1,440,124	17.5	Va.....	65,227	13.3
Wabash.....	267,734	109	483,664	199	1,438,532	22.0	Wabash.....	2,817,611	18.1
West. Md.....	6,255	7	521,314	60	1,069,876	19.5	West. Md.....	5,246,673	15.8
West. Pac.....	89,000	75	173,100	145	1,908,300	17.0	West. Pac.....	1,776,378	16.0
W. & L. E.....	115,162	226	181,388	350	753,034	22.5	W. & L. E.....	4,398,400	36.8
								925,219	10.5

* September.

† August.

‡ Total Material.

* October estimated.

Classified Purchases, Class I Roads, 1938*

	(000)	(000)		(000)	(000)
Frogs, switches and track fastenings	\$20,735		Shop fuel	\$6,217	
Track tools, motor cars and fencing	2,528		Foundry supplies, firebrick, clay	686	
Interlocking and signal and tel. & tel.	9,380		Wheels, tires and axles	21,708	
Brick, cement, lime, stone, etc.	4,500		Locomotive and car lumber	3,858	
B. & B. lumber and piling	10,363		Machinery, boilers, fireboxes, and miscellaneous ..	3,068	
Switch ties	3,149				
Crossties	38,443		Total Maintenance of Equipment		\$121,863
Bridges, turntables, etc.	1,250		Train and station supplies	6,967	
Ballast and riprap	7,444		Oil House Material	16,716	
Rail—new and usable	15,809		Ice house supplies	6,937	
Fuel and water station material, etc.	3,221		Fuel for locomotives and stations	240,981	
Chemicals for timber treatment	3,796		Commissary supplies	16,010	
Total Maintenance of Way and Structures		\$120,618	Total Conducting Transportation		287,611
Bolts, nuts, washers, etc.	3,805		Iron and steel pipe and fittings	3,087	
Springs	1,288		Electrical material for buildings	3,168	
Boiler tubes, Superheater units, etc.	4,529		Hardware	6,209	
Tubing and soft metals	1,568		Rubber and leather	4,289	
Bar and sheet iron and steel	6,414		Glass, drugs, paint, etc.	12,117	
Locomotive and car forgings	8,509		Stationery and Printing	13,216	
Locomotive and car castings	20,340		Miscellaneous and unclassified	7,126	
Brass castings and journal bearings	18,927				
Air brake material	3,975		Total Common to All Departments		49,212
Locomotive appliances	6,465				
Passenger car trimmings	2,799				
Electrical materials	4,116				
Automotive material	3,591				

* Purchases other than ties, rail and fuel estimated on the basis of reports from 29 railroads—Subject to revision.

000 larger on November 1 than on January 1, 1936, when they first began to increase.

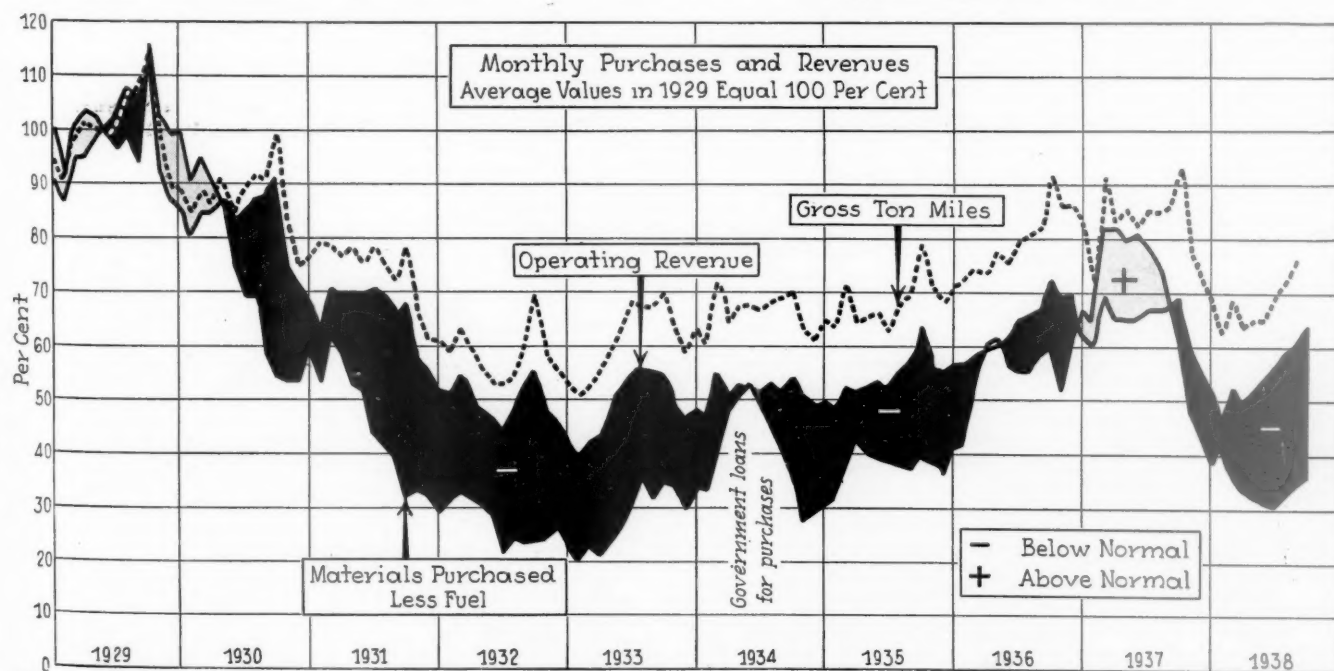
\$960,000,000 of Deferred Buying

The relation between purchases and revenues has been employed as a measure of deferred buying and as an indicator of the extent to which the railroads are catching up with it or falling behind. This is on the assumption that while less material is required by railroads in periods of light traffic than in periods of heavy traffic, the purchases of materials which are needed for adequate maintenance should bear a reasonably constant relation to the revenues. In 1929 the relation was reasonably constant and the ratio of materials, exclusive of fuel and equipment, to operating revenues averaged 15.7 per cent. During 1932 purchases were only 6.9 per cent of the corresponding revenues. In June, 1937, the ratio was 18.8 per cent. In June, 1938, it was down to 8.6 per cent and during the first 10 months of 1938 purchases of material averaged only 9.5 per cent of the revenues for the period.

Purchases and revenues last year and in the nine

previous years are compared in two charts. One shows the fluctuations of monthly purchases and monthly revenues since 1929 and the other shows the fluctuations in the ratio of purchases to revenues during the same period.

After adjusting for changing prices it has been computed that in the period prior to 1937 the railroads spent approximately \$755,000,000 less in the aggregate for materials, exclusive of equipment and fuel, than would have been spent if they had consistently appropriated as much per dollar of the operating revenues as in 1929. Approximately \$65,000,000 of this developed in 1930, \$138,000,000 in 1931, \$144,000,000 in 1932, \$139,000,000 in 1933, \$68,500,000 in 1934, \$135,000,000 in 1935, and \$65,000,000 in 1936. By the same reasoning, they spent \$57,000,000 more in the first eight months of 1937 than would have been spent under the rate of buying in 1929 but this was reduced to an all-year total of \$22,000,000 by the declines in the last four months of 1937. By the same reasoning the railroads fell behind approximately \$185,000,000 during 1938, with the result that an indicated total deferred buying now exists of approximately \$961,500,000.



Comparative Trends of Purchases, Revenues and Gross Ton-Miles January, 1929, to November, 1938. Black Areas Indicate Where Railroads Were Behind in Their Rate of Buying. Shaded Areas Indicate Where They Were Catching Up. Purchases exclude Fuel and Rolling Stock

Railway Material Costs Dip in '38



Handling Car Scrap at Silvis, Ill.

AS predicted in these columns last year, railway material costs have fallen somewhat from the levels reached in 1937. Prices were adjusted downward too late in 1938 to make much difference in all-year averages but the declines in most prices since this time last year have lessened the tension under which the railroads did their buying in 1937 and now permit them to get substantially more for their money than for many months.

Major developments influencing costs were the decline of general business in the early months of the year; the collapse of farm prices; governmental action on freight rates, coal prices and monopolies, the new wage and hour law, changes in basing points for steel prices and hostilities abroad.

Cheaper Coal and Oil

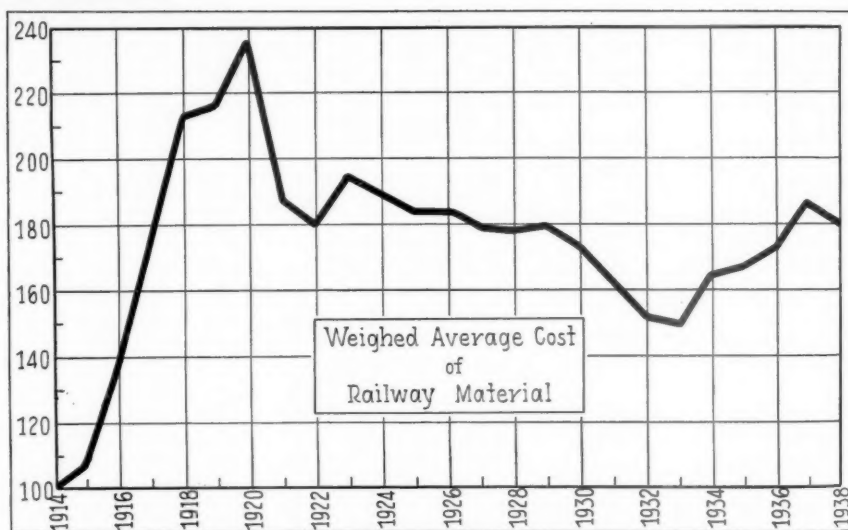
The cost of bituminous coal for locomotives to all roads, as reported by the Interstate Commerce Commission, averaged three per cent more at the mine in 1938 than in 1937 and five per cent more with freight and handling charges included. However, coal, at \$1.91 per net ton at the mine, now averages five per cent less than in January, 1938, while the present average price of \$2.52 per ton with transportation is now four per cent less than last January.

The all-year fuel oil average to the railroads in 1938, freight included, was one per cent less than the all-year average for 1937 and the all-year cost at refineries was three per cent less than the all-year average in 1937

More material for the money available to roads, following five to ten point decline in controlled prices

By D. A. Steel

Purchases and Stores Editor



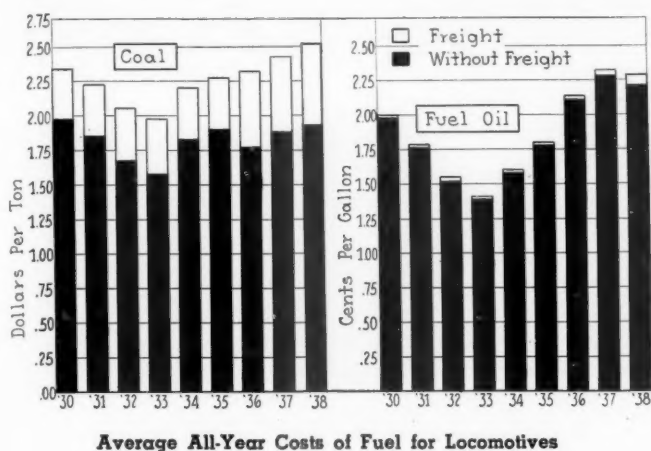
Trend of Year-Average Cost of All Railway Materials, 1914-1938

while prices at refineries now average eight per cent less than at this time a year ago.

Cross ties and lumber averaged about 10 per cent under 1937 but lumber is now costing 18 per cent less than at this time last year.

Rails and other materials of iron and steel cost as much in the aggregate last year as in 1937, but rails at \$40 per ton since October now cost 5.9 per cent less than at this time last year and other materials of iron and steel in the composite are now averaging five per cent under a year ago. The corresponding decline in the average cost of miscellaneous material was seven per cent.

The weighted all-year average cost of all materials in 1938 represented a 3.6 per cent decline from the all-year average in 1937, with present values showing a 7.6 per cent decline from a year ago. Material and fuel prices averaged 1.5 per cent under 1937 and are now 5.2 per cent below a year



ago. Rolling stock now costs eight per cent less per pound than a year ago and scrap iron and steel is selling 7 per cent under a year ago, after a decline in the all-year average of 19 per cent.

At present levels, the cost of coal at the mine is 15 per cent above the all-year average in 1933 and 8 per cent lower than in 1929. Oil prices are 52 per cent above those for 1933 and 1 per cent over 1929. Ties are costing about 11 per cent more than in 1933 and 11 per cent less than in 1929. Lumber prices are 1 per cent below those for 1933 and 6 per cent under 1929. The cost of rail tallies with 1933 and is 10 per cent under 1929. Iron and steel prices are 15 per cent above 1933 and 8 per cent over 1929 while the composite of prices of all materials is 13 per cent above 1933 and about 1 per cent less than in 1929.

Cars and locomotives built to present specifications are costing approximately 43 per cent more per unit than equipment built in 1933, and approximately 60 per cent more per unit than equipment built in 1929. Scrap iron is 80 per cent higher than in 1933 and 2 per cent higher than in 1929. Present fuel oil prices correspond with those in 1935 while lumber and steel prices correspond closely with those of 1936.

A Chance to Save Over \$50,000,000

Last year it was estimated in these columns that annual expenses of the railroads had been increased approximately \$105,900,000 by the higher costs of

material and equipment in 1937 and had been increased approximately \$235,000,000 by the total increases in costs of materials and equipment since 1933. Purchases of materials and equipment corresponding to those made in 1937 would now cost approximately \$56,000,000 less than in 1937, approximately \$156,000,000 less than if bought at the average prices prevailing in 1933 and approximately \$18,000,000 less than if purchased at the average prices in 1929. This assumes that the buying could be done at present prices.

Since, with few exceptions, prices were forced down by a scarcity of buying and not because of reductions in manufacturing costs other than for raw materials, it is taking a lot for granted to assume that prices this year will be insensitive to increases in the rate of buying, especially to the rate of railway buying and business activity which prevailed in 1937. The outlook is definitely for increased railway buying this year, as will be discussed in detail in another article. Suffice it to state in this discussion, however, that in a poll recently taken of the opinions on representative roads, five roads out of seven predict in-

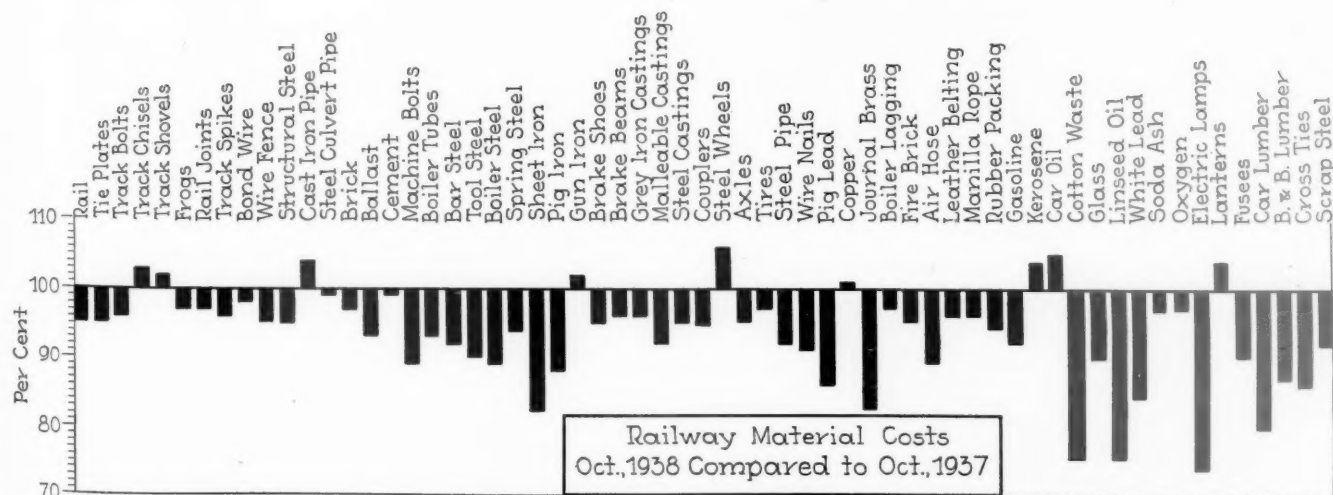
Relative Costs of Railway Material

	1938 to 1937		1938 to 1933		1938 to 1929	
	12 Mos. Index	Oct. to Oct. Index	12 Mos. Index	Oct. to Oct. Index	12 Mos. Index	Oct. to Oct. Index
Coal	103*	98.5*	122*	115*	96*	92*
Fuel oil	97	92.0	160	152	107	101
Gasoline	96	92.0	98	94	68	65
Ties	90	86	115	111	93	89
Lumber	87	82	105	99	100	94
Rail	101	95.4	107	100	96	90
Iron and steel ..	101	95	123	117	116	109
Miscellaneous ..	94	93	112	100	86	85
Materials	96.4	92.3	118	113	103	99
Materials and fuel	98.5	94.8	122	117	103.8	101
Rolling Stock per unit	97	92	150	143	170	160
Scrap Iron and steel	81	91	161	180	91	102

* Excluding Freight

creases in fuel buying, four will order more rail, three will buy more ties, four will buy more lumber and four will buy up to 20 per cent more maintenance materials.

Prices beyond the first quarter of this year are thus



How the Average Prices Paid for Various Railway Material in October, 1938 Compared with the Corresponding Average Prices in October, 1937

TRACK MATERIALS

Compiled from special reports made by railroads to the *Railway Age*.

Compiled from special reports made by railroads to the *Railway Age*.

somewhat problematical. While railroad buyers still complain about price monopolies, there was no lack of competition for their orders last year and conditions as to deliveries and adherence to specifications were good. The increases in freight rates obtained by the railroads last year have been extended but the downward adjustments in steel prices made last fall have been reaffirmed for the first quarter this year. There are still many materials for which the prices are still out of line with

the prevailing trend. No immediate effect of the wage and hour law on the prices of materials purchased by railroads is predicted. It will be some time before the coal commission is ready to try its new coal prices on the public and federal suits against monopolies are temporarily a deterrent to higher prices for oil, cement and kindred products. According to opinion among the railroads, increases in coal prices are unlikely. Only one out of eight roads looks for higher iron

Average Cost of Locomotive Coal Per Ton Class I Railways—10 Months, 1938

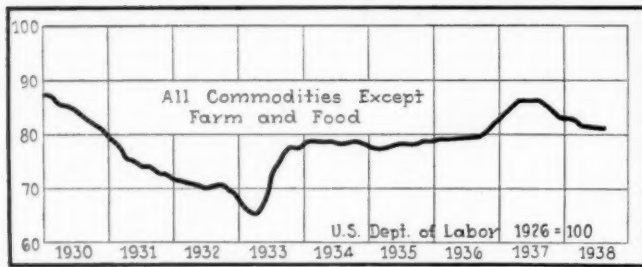
Region and Road	Less Freight		Plus Freight		Region and Road	Less Freight		Plus Freight	
	1938	1937	1938	1937		1938	1937	1938	1937
New England Region:					Southern Region—Continued				
Bangor & Aroostook	\$4.80*	\$4.48*	\$5.23	\$5.01	Charleston & Western Carol.	\$1.92	\$1.88	\$3.52	\$3.38
Boston & Albany	1.84	1.76	4.70	4.57	Cin., New Orleans & Tex. Pacific..	2.00	1.93	2.38	2.31
Boston & Maine	1.76	1.70	4.55	4.37	Clinchfield	1.85	1.76	1.96	1.84
Canadian National (In New Eng.) ..	2.04	1.49	4.72	4.99	Columbus & Greenville	1.47	1.33	2.50	2.54
Canadian Pacific (In Maine)	1.88	1.72	5.20	5.54	Georgia	1.85	1.69	3.81	3.63
Canadian Pacific (In Vermont)	1.95	1.80	5.30	5.08	Georgia & Florida	1.81	1.82	3.67	3.60
Central Vermont	1.76	1.71	5.03	5.01	Georgia, Southern & Florida	2.13	2.01	3.92	3.76
Maine Central	3.29	3.19	4.92	4.58	Gulf & Ship Island	1.63	1.59	3.78	3.66
New York, New Haven & Hartford.	1.72	1.67	4.19	4.00	Gulf, Mobile & Northern	1.36	1.30	2.30	2.15
Rutland	1.59	1.51	4.21	4.12	Illinois Central Lines	1.86	1.85	2.18	2.15
Great Lakes Region:					Louisville & Nashville	1.89	1.79	2.05	1.94
Ann Arbor	1.80	1.74	3.78	3.64	Mississippi Central	1.24	1.27	3.30	3.22
Cambria & Indiana	2.08	2.07	...	...	Mobile & Ohio	1.74	1.72	1.87	1.91
Delaware & Hudson	1.91	2.18	3.89	3.74	Nashville, Chat. & St. Louis	2.17	2.09	2.36	2.27
Delaware, Lack. & Western	1.92	1.89	3.44	3.32	New Orleans & Northeastern	2.16	2.07	4.13	3.88
Detroit & Mackinac	1.82	1.82	4.38	4.07	Norfolk Southern	1.74	1.71	3.61	3.51
Detroit & Toledo South Shore	1.85	1.78	3.84	3.68	Northern Alabama	2.01	2.00	2.16	2.07
Erie (Inc. Chicago & Erie)	2.08	1.92	2.61	2.51	Seaboard Air Line	1.95	1.81	3.15	2.96
Grand Trunk Western	1.56	1.57	3.37	3.27	Southern	1.86	1.79	1.99	1.91
Lehigh & Hudson River	1.80	1.71	4.54	4.34	Tennessee Central	1.79	1.78	2.12	2.00
Lehigh & New England	1.81	1.69	3.22	3.28	Northwestern Region:				
Lehigh Valley	1.83	1.72	3.70	3.60	Chicago & North Western	1.67	1.62	2.20	2.15
Monongahela	1.88	1.74	2.05	1.88	Chicago Great Western	1.44	1.49	2.58	2.62
Montour	2.05	1.96	2.06	1.95	Chicago, Milw., St. P. & P.	2.09	1.98	2.11	2.33
New Jersey and New York	2.07	1.91	5.15	4.89	Chicago, St. P., Minn. & Omaha ..	1.50	1.42	4.31	4.36
New York Central	1.90	1.89	2.21	2.20	Duluth, Missabe & Iron Range	2.09	2.20	4.62	4.42
New York, Chicago & St. Louis	1.95	1.90	3.51	3.26	Duluth, South Shore & Atlantic ..	...	...	4.94	4.61
New York, Ontario & Western	1.89	1.84	3.68	3.55	Duluth, Winnipeg & Pacific .....	...	...	4.78	4.55
New York, Susque. & Western	2.05	1.95	4.48	4.62	Great Northern	1.39	1.47	3.38	3.63
Pere Marquette	1.95	1.90	3.95	3.79	Green Bay & Western .....	...	...	4.48	4.45
Pittsburgh & Lake Erie	2.01	1.96	2.24	2.11	Lake Superior & Ishpeming .....	...	...	4.97	4.82
Pittsburgh & Shawmut	2.11	1.86	2.24	1.93	Minneapolis & St. Louis	1.75	1.75	1.97	2.03
Pittsburgh & West Virginia	1.79	1.82	1.94	1.86	Minn., St. P. & Sault Ste. Marie ..	1.48	1.44	3.90	3.69
Pittsburgh, Shawmut & Northern ..	2.16	2.06	2.16	2.05	Northern Pacific	1.54	1.55	2.09	2.14
Wabash	1.89	1.85	2.23	2.20	Spokane International	2.89	2.89	4.31	4.40
Central Eastern Region:					Spokane, Portland & Seattle	3.42	3.57	...	5.24
Akron, Canton & Youngstown	1.95	1.84	3.36	3.16	Central Western Region:				
Baltimore & Ohio	1.94	1.85	2.03	1.94	Alton	1.97	1.90	2.21	2.08
Bessemer & Lake Erie	2.07	2.00	2.50	2.19	Atchison, Topeka & Santa Fe	2.67	2.63	2.85	2.79
Central of New Jersey	2.02	1.88	3.69	3.59	Chicago, Burlington & Quincy	1.64	1.64	1.81	1.80
Chicago & Eastern Illinois	1.85	1.90	1.98	2.02	Chicago, Rock Island & Pacific	2.11	2.07	2.36	2.34
Chicago & Illinois Midland	1.75	1.57	1.90	1.70	Colorado & Southern	2.64	2.60	2.78	2.73
Chicago, Ind. & Louisville	1.91	1.79	2.07	1.97	Denver & Rio Grande Western	2.12	2.10	2.18	2.17
Detroit, Toledo & Ironton	1.75	1.77	2.74	2.77	Denver & Salt Lake	1.83	1.40	1.57	1.39
Elgin, Joliet & Eastern	1.94	1.86	2.12	1.99	Ft. Worth & Denver City	2.66	2.66	5.29	5.03
Illinois Terminal	1.91	1.89	2.05	2.00	Nevada Northern	2.07	1.86	5.09	4.83
Long Island	2.09	2.02	4.63	4.42	Northwestern Pacific	2.21	2.21	...	...
Missouri-Illinois	1.74	1.72	1.81	1.83	Southern Pacific (Pacific Lines) ..	3.20	3.07	3.55	3.31
Pennsylvania System	2.02	1.94	2.14	2.04	Toledo, Peoria & Western	1.40	1.61	1.60	1.78
Penna.-Read. S. S. Lines	1.95	1.91	4.74	4.54	Union Pacific	2.01	1.97	2.13	2.09
Reading	2.30	2.12	3.68	3.35	Utah	1.65	1.62	1.57	1.71
Staten Island Rapid Transit	2.19	2.09	4.70	4.43	Western Pacific	2.12	2.03	3.44	3.34
Western Maryland	2.06	1.96	2.22	2.11	Southwestern Region:				
Wheeling & Lake Erie	2.03	2.01	2.19	2.10	Kansas City Southern	1.98	1.84	2.31	2.24
Poconos Region:					Kansas, Oklahoma & Gulf	2.18	2.07	2.22	2.11
Chesapeake & Ohio	2.10	2.01	2.17	2.07	Louisiana & Arkansas	2.16	1.91	...	...
Norfolk & Western	1.93	1.84	2.00	1.89	Midland Valley	1.60	1.58	1.86	1.78
Richmond, Fred. & Potomac	1.63	1.44	4.17	3.90	Missouri & Arkansas	2.13	2.18	2.76	2.79
Virginian	1.69	1.57	2.13	2.04	Missouri-Kansas-Texas Lines	2.25	2.17	2.61	2.49
Southern Region:					Missouri Pacific	1.86	1.83	1.94	1.91
Alabama Great Southern	2.28	2.13	2.35	2.20	Oklahoma City-Ada-Atoka .....	...	...	2.75	2.59
Atlanta & West Point	2.18	2.01	3.51	3.31	St. Louis-San Francisco	2.02	1.96	2.16	2.13
Atlanta, Birmingham & Coast	2.20	2.10	2.47	2.40	St. Louis-San Francisco & Texas ..	2.23	1.78	...	...
Atlantic Coast Line	1.86	1.80	3.61	3.42	St. Louis Southern	1.58	1.42	2.36	2.27
Central of Georgia	2.42	2.36	2.56	2.47	Texas & New Orleans	2.67	2.53	...	...

Source—I. C. C.
* F. O. B. Dock

Class I Switching and Terminal Companies—10 Months, 1938

Region and Road	Less Freight		Plus Freight		Region and Road	Less Freight		Plus Freight	
	1938	1937	1938	1937		1938	1937	1938	1937
Alton & Southern	\$1.49	\$1.47	\$2.42	\$2.37	Minnesota Transfer	\$...	\$...	\$5.54	\$5.27
B. & O. Chicago Terminal	2.02	1.81	3.62	3.52	Monongahela Connecting	3.84	3.78	3.94	3.86
Belt of Chicago	1.67	1.70	3.05	3.00	New Orleans Terminal	2.15	2.09	4.60	4.40
Chicago & Western Indiana	1.70	1.65	3.19	3.01	Newburgh & South Shore	1.62	1.74	3.08	3.15
Chicago River & Indiana	1.46	1.40	3.16	3.04	Ogden Union Ry. & Depot	2.07	2.01	4.12	3.99
Cincinnati Union Terminal	3.50	3.36	3.52	3.41	Peoria & Pekin Union	2.01	2.22	2.17	2.39
Coneaugh & Black Lick	2.39	2.43	2.39	2.43	Portland Terminal	3.52	3.38	4.84	4.52
Detroit Terminal R. R.	1.96	1.80	4.08	3.75	St. Paul Union Depot	3.73	...	6.33	6.08
Indiana Harbor Belt	1.47	1.40	3.20	3.02	Terminal of St. Louis	1.67	1.58	2.69	2.49
Indianapolis Union	1.70	1.74	2.99	2.93	Terminal of New Orleans	1.52	1.64	...	...
Kansas City Terminal	1.85	1.79	3.70	3.51	Toledo Terminal .....	...	...	3.55	3.56
Kentucky & Indiana Terminal ..	1.50	1.50	2.84	2.77	Union of Penna.	2.32	2.24	2.30	2.27
Lake Terminal	1.59	1.59	3.47	3.38	Washington Terminal	2.08	1.98	4.67	4.47

Source—I. C. C.
* F. O. B. Dock



Composite Trend of Wholesale Prices

and steel prices. Four roads expect stronger lumber prices and three expect to pay more for ties, while manufacturers, in their anxiety to revive purchasing, will be circumspect about their quotations on appliances and rolling stock.

Roads Watching Coal Contests

Coal took 25 per cent of all railway expenditures for materials in 1937 and 40 per cent of these expenditures last year. Coal traffic also produces over 20 per cent of all railway revenues and up to 60 per cent of the revenues of some roads—hence the carriers' continuing interest in this commodity. Bituminous production to December 3 totaled 309,006,000 tons, which was a 24.5 per cent decline from the corresponding production in the year previous while 46,616,000 tons of anthracite mined to December 3 reflected a 14.3 per cent decline.

These declines in production were much larger than the declines in the cost of coal to the railroads. Bituminous mining, however, is governed by a 35-hour week, with a basic wage of \$6 per day in the North and \$5.60 in the South, or 112 per cent higher than labor costs in May, 1933, a fact which naturally restricts fluctuations in costs of production. Taxes were also higher per ton last year and the 3 to 15 cents per ton increase in freight rates on coal allowed the railroads in 1937 and extended indefinitely by recent action of the I. C. C. have been factors in coal costs paid by railroads. It is also true that coal purchased under annual contracts based on wage scales does not always show the full declines in costs from month to month.

Coal prices would have been higher last year if the National Bituminous Coal Commission had succeeded in its first attempt to fix prices. This body, created by the Bituminous Coal Act of 1936 to establish minimum prices at which bituminous coal could be sold, announced prices on November 30, 1937, which became effective December 16, 1937, but met opposition from various consumers including the railroads in the A. A. R. and in the American Short Line Association which attacked the legality of the cost-finding methods in the courts. On February 10, 1938, the Circuit Court of Appeals at Washington granted injunctions in favor of the railroads and other petitioners and when other courts began following this precedent the coal commission suspended all its price orders on February 25 and left bituminous prices to the mercies of free competition.

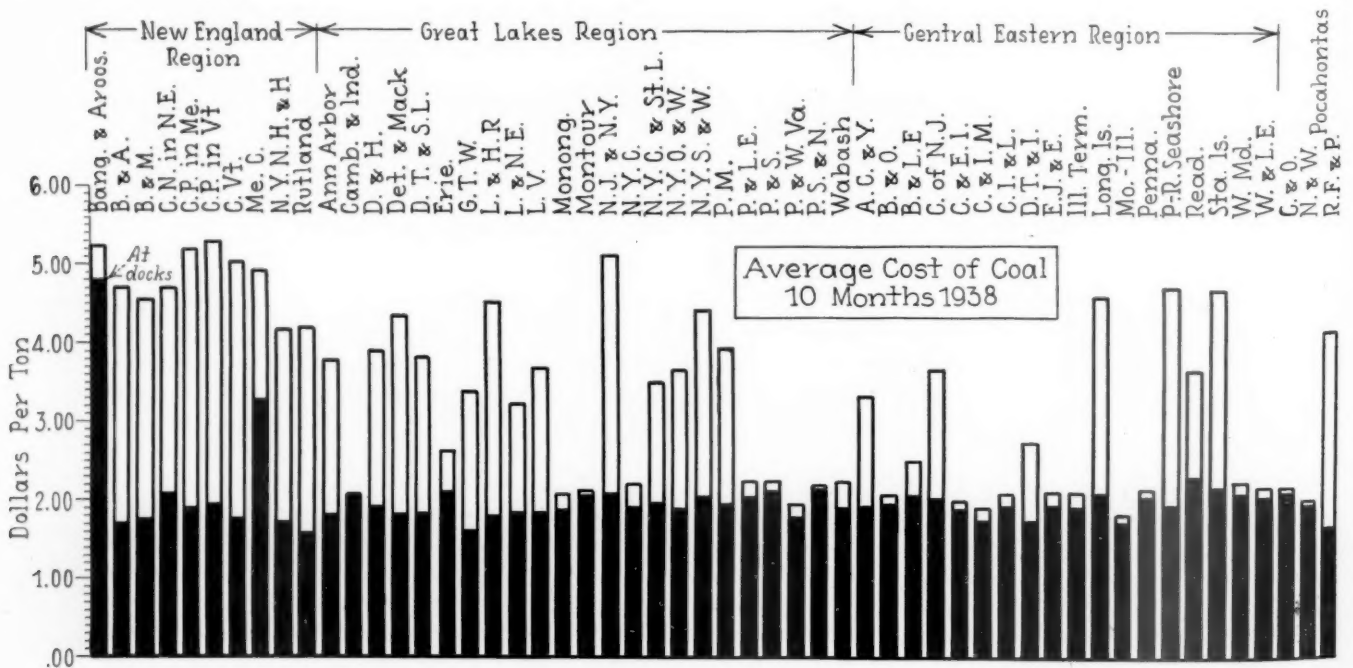
Later, demands were made on producers to refund increased prices paid under the commission's order and the price-fixing program received another smashing blow

Cost of Fuel for Locomotives

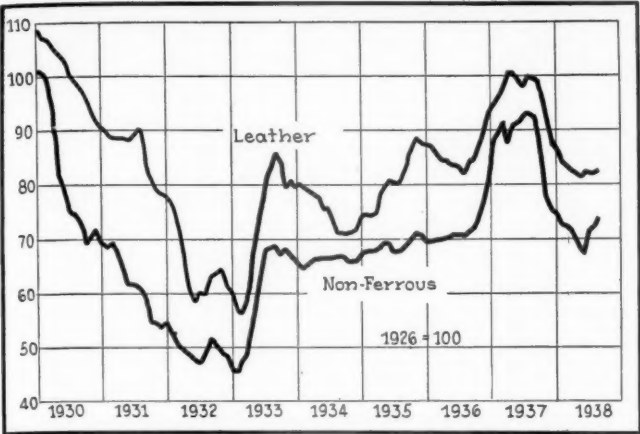
	Coal Per Net Ton		Fuel Oil Per Bbl.	
	Incl. frt.	Excl. frt.	Incl. frt.	Excl. frt.
1925	\$2.72	...	\$1.32	...
1926	2.63	...	1.24	...
1927	2.66	\$2.21	1.18	\$1.14
1928	2.53	2.12	1.04	1.01
1929	2.40	2.01	.89	.86
1930	2.34	1.95	.84	.82
1931	2.21	1.84	.74	.73
1932	2.05	1.66	.65	.63
1933	1.96	1.58	.59	.58
1934	2.20	1.83	.68	.67
1935	2.27	1.89	.76	.80
1936	2.34	1.79	.87	.87
1937	2.43	1.89	.97	.96
1938 Jan.	2.57	2.01	.97	.96
June	2.51	1.94	.97	.90
Sept.	2.47	1.91	.94	.89
9 Mos.	2.52	1.93	.96	.93

Source—I. C. C.

when the court, in a decision on June 29, declined to reinstate the Coal Commission's orders for the purpose of nullifying these demands for refunds. The Coal Commission and district boards, with a new chairman, then began the laborious task of starting all over and has been



Average Cost of Coal for Locomotives—10 Months 1938



Fluctuations in Prices of Raw Materials

engaged all year in re-establishing prices according to a procedure which they hope will stand the test of legality. The distinguishing feature of this procedure is the holding of public hearings to permit the introduction of evidence on the cost data of individual producers.

Even this procedure has not proceeded without opposition, however. The Circuit Court of Appeals issued an injunction on October 3 restraining the Commission from requiring cost data of one producer, pending a decision on his appeal from the commission's order and certain consumer-groups are now waiting a decision on a petition argued before a three-judge court in Washington on November 18, attacking the constitutionality of the act and the authority of the commission to fix prices. It is unlikely that the Commission will be ready to announce its new prices for several months and in all probability the new prices will only precipitate further controversies.

Meanwhile the time approaches for a new wage agreement between the coal operators and the United Mine Workers, led by John L. Lewis. The present agreement was made in April, 1937, and expires on April 1 this year and the negotiations, which will begin on March 14, will be followed with concern since the agreement practically establishes the wages and working conditions throughout the bituminous coal industry. What demands

the miners will make in their negotiations this year is uncertain but, with operators antagonistic to absorbing any longer the increased freight rates on coal, it is not surprising to see increased buying of coal for storage. Weekly production crossed the 1937 line on November 19.

Fuel Oil Prices Easier

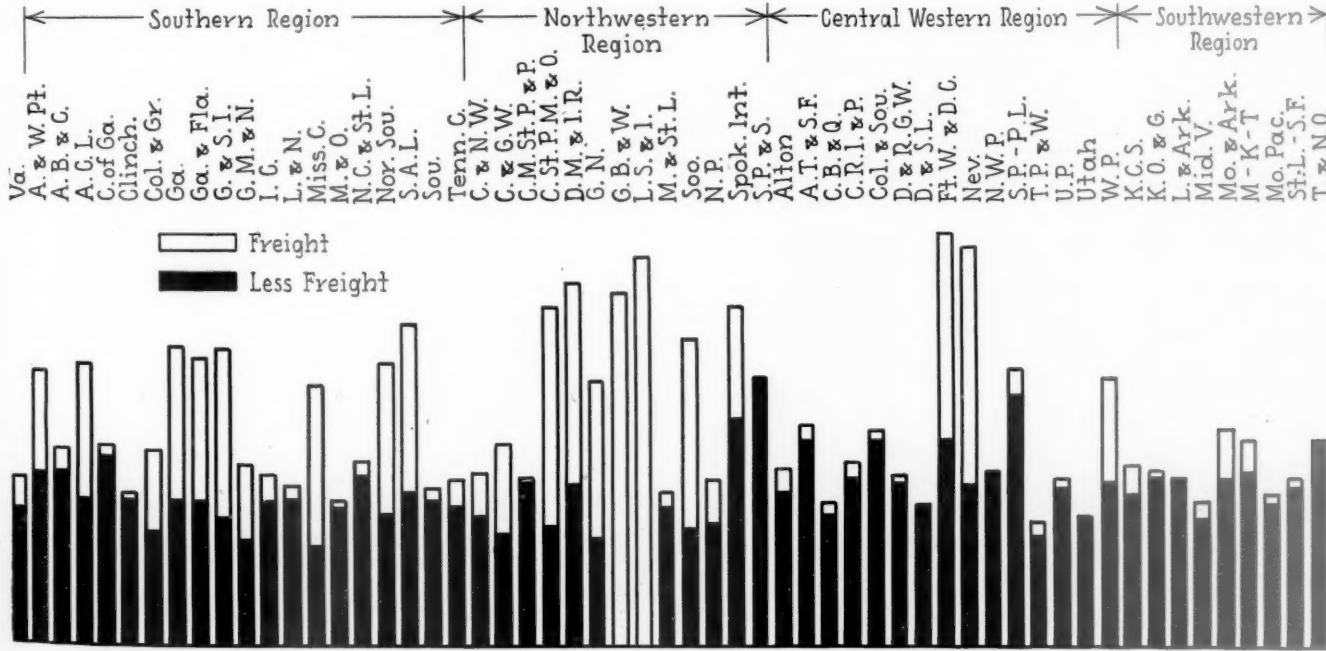
With the phenomenal increase in the introduction of Diesel-electric equipment for switching and passenger service, culminating in the introduction of Diesel-electric power on the Baltimore & Ohio, a coal road, and the purchase of six large units for passenger service on the Seaboard Air Line, the consumption of petroleum fuel for locomotives grows. At this time last year fuel oil for steam locomotives was increased 10 cents a barrel, with the result that preparations were begun in some districts to refit locomotives for burning coal. The continued de-

Relative Costs of Railway Materials

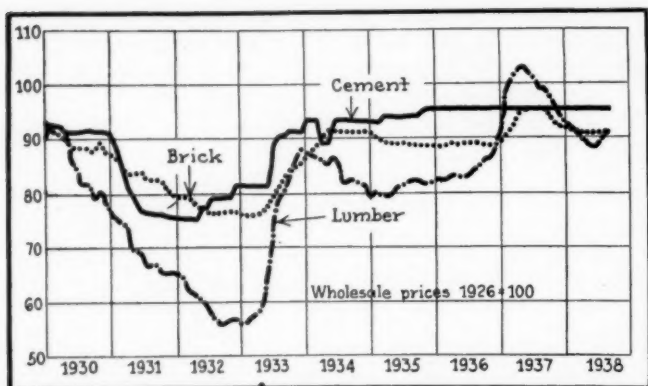
WEIGHTED ALL-YEAR AVERAGES 1914 = 100			
1914	100	1922	179
1915	107	1923	194
1916	132	1924	189
1917	177	1925	184
1918	212	1926	183
1919	216	1927	179
1920	236	1928	178
1921	187	1929	180
1930		1931	162
1931		1932	151
1932		1933	149
1933		1934	165
1934		1935	167
1935		1936	173
1936		1937	186
1937		1938	181

cline of business and the success of the government last spring in its suit against oil producers for alleged agreements to control prices in violation of the Sherman Anti-trust Act put an end to such plans. Crude, while reduced below the production of 1937, was plentiful and spot oil was obtainable during the last six months of 1938 at prices considerably below the fuel oil price level of 1937. While fuel oil for railroads averaged 90 cents per bbl. last October, some roads filled all their requirements for as low as 67 cents per bbl.

The average cost of gasoline of 7.15 cents per gal. last October to 12 railroads was 13 cents a barrel less than was paid a year ago, and this average was con-



As Reported to I. C. C. Mine Costs Not Reported Where Not Shown

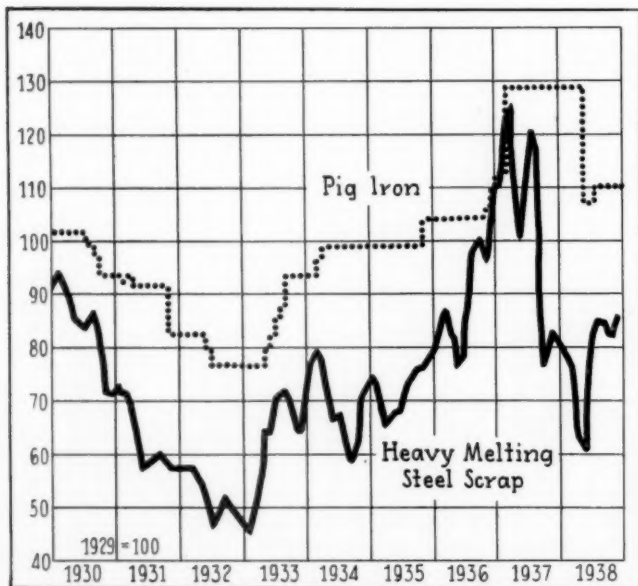


Trends in Prices of Building Materials

siderably below that prevailing in 1929. The lowest price reported by railroads last year for gasoline was 3.75 cents per gal. less tax.

Lower Rail—New Basing Points

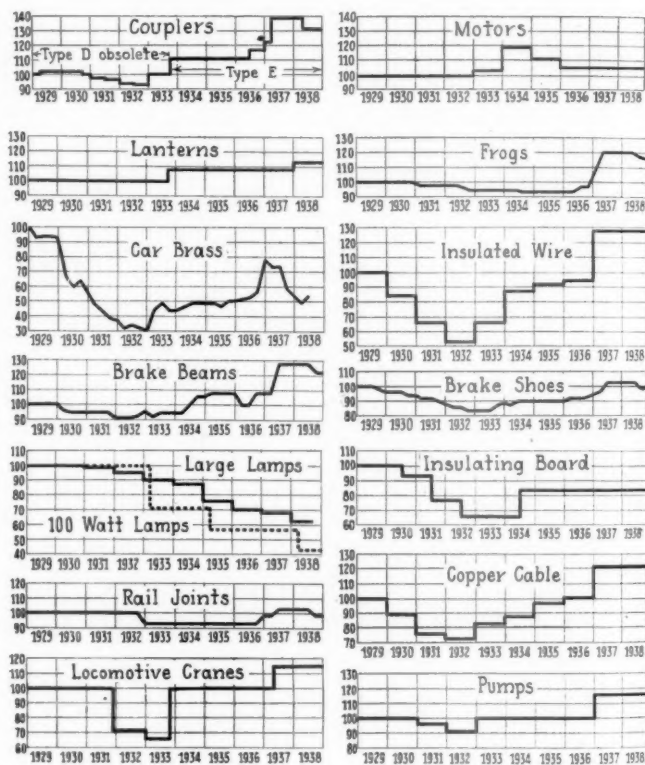
In contrast with 1937, which was one of the best years the steel industry had, 1938 was one of the worst in point of output. Ingot production last January, at 29 per cent of mill capacity, was the lowest in 20 years with the exception of 1932 and 1933 and this condition continued through June when steel operations fell to 25 per cent. There was no demand for price changes during this period and the base prices of iron and steel remained at the levels to which they had been raised in 1937, with the notable exception of pig iron, the prices of which were temporarily increased well above the levels of the previous years by war talk and armament programs. The feeling grew, however, that prices would eventually be adjusted downward and the first definite break came in July when the mills announced reductions of \$2.50 to \$3 per ton or from four to eight per cent in the prices of various steels in car lots for the purpose, as frankly stated, of meeting competition and stimulating buying. These prices did not at first extend to railroad materials but corresponding adjustments in these prices were made by October. The effect of this action was to reduce the level of iron and steel prices to those prevailing in 1936.



Comparative Changes in Pig Iron and Scrap Prices

Simultaneously with these adjustments in basic steel prices was the abandonment in June of the basing point system of pricing steel products, with the result that quotations will hereafter be identical at Pittsburgh, Chicago and Birmingham. This development is expected to have a pronounced although an indeterminate effect as yet on the delivered cost of steel to many railroads. Following these adjustments in prices and the national election, the demand for steel increased and steel mills operated above 60 per cent of their capacity in December.

The average cost of tie plates last year declined from \$46.44 per ton in January to \$43.51. Track bolts declined from \$4.52, a cwt. to \$4.36. Track spikes declined from \$3.24 a cwt. to \$3.04. Cast iron pipe declined from \$50.30 a ton to \$46.70. Machine bolts dropped from \$4.80 per 100 to \$4.50. Bar steel fell from \$2.54 a cwt. to \$2.34. Boiler steel declined from \$2.48 a cwt. to \$2.28. Sheet iron declined from \$3.33 a cwt. to \$2.84. Brake shoes fell from \$48.60 a ton to \$47.00.

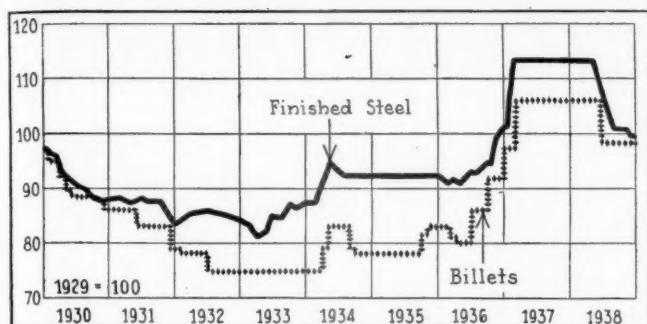


Comparative Price Trends of Special Materials and Devices

The average cost of steel castings fell from \$12.80 a cwt. to \$12.10. Couplers declined from \$53.50 a pair to \$50.60. Car wheels costs declined from \$35.00 each to \$33.30. Axles declined from \$5.90 a cwt. to \$5.71. Tires fell from \$6.25 a cwt. to \$6.10, and steel pipe declined from 7.6 cents a foot to 6.9 cents. No changes have been observed in the prices of tools and in almost all instances the average costs of iron and steel are still above the levels in 1929.

Better Values for Scrap

Significant of scrap iron, which the railroads sell in large quantities each year, is the fact that while prices averaged far less in 1938 than in 1937 they have been increasing since last June after a head-long decline of 12 months duration. The composite average of \$10.30 for the last quarter of 1938 for No. 1 wrought was an average increase of \$1.45 per ton over the second quar-



Comparative Trends in Finished Steel and Steel Billets

ter of 1938. The average price of \$12.23 per ton paid to the railroads last October for heavy melting steel was well below the prices obtained by roads near the best markets, but \$1.60 per ton greater than in the second quarter and the average price of \$14.79 a ton obtained for rail was a 10 per cent increase over the low average. These increases in scrap values have encouraged railroads to resume equipment dismantling operations and other scrap handling work on a large scale and, with this commodity furnishing about one-half of the raw material for steel production in the country and in such demand abroad for war purposes, continued recovery in scrap iron values is expected despite a temporary set back in December.

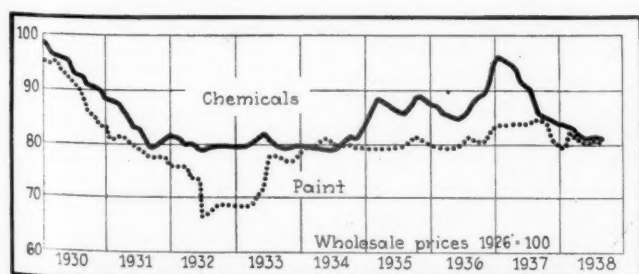
Bargains in Lumber

Unlike the prices of manufactured materials, which are largely controlled and can survive long periods of declining business, lumber prices still fluctuate with demand and competition among various producing districts.

Lumber Prices—West Coast

	December, 1937 1,000 Bd. Ft.	December, 1938 1,000 Bd. Ft.
Car siding	\$36.00	\$26.00
Car lining	28.00	23.00
Car decking	20.00	16.00
Car framing	20.00	16.00
Car sills	24.00	19.00
Car running boards	30.00	26.00
Bridge timbers	16.50	14.00
Bridge stringers	20.00	17.50
Bridge caps	25.00	21.00
Plank	12.00	11.50
Dimension	14.50	12.50
Average	22.35	18.40

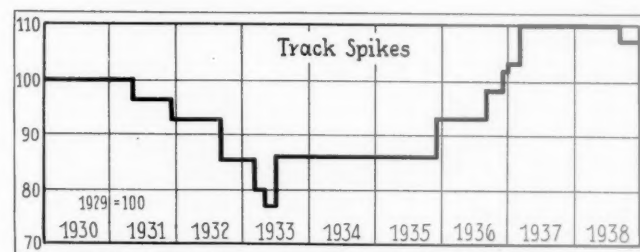
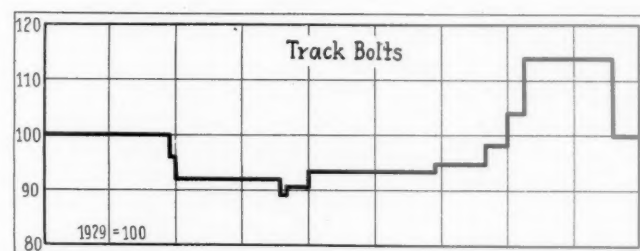
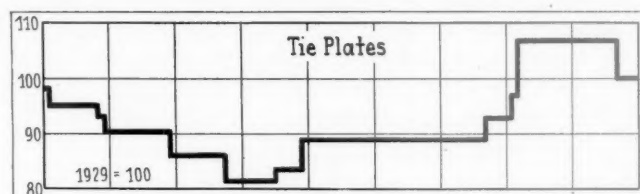
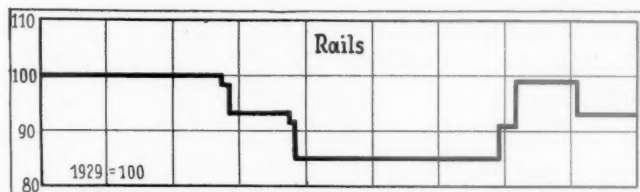
After rising sharply in the fall of 1936 and reaching a ten-year peak in the early part of 1937, lumber prices began to decline about the time business activity began to recede in 1937 and they continued on the down grade until last June, when a revival of building in this coun-



Variations in Prices of Chemicals and Paint

try reversed the trend, although not enough to do more than to restore prices to levels prevailing at the close of 1936. While most railroad lumber is special to mills, the demand for lumber by the railroads last year was so small that practically all roads obtained prices substantially below than the lowest prices in 1937.

A comparison between prices paid for railroad lumber on the West Coast in December, 1938, and prices paid in December, 1937, is given in a table and shows a saving to railroads of \$10 per 1,000 bd. ft. or 27.5 per cent on car siding, \$5 or 17.5 per cent on car lining, \$4 or 20 per cent on car decking, \$5 or 20.5 per cent on car sills, \$2.50 or 15 per cent on bridge timbers and \$2 or 13.5



Comparative Fluctuations in Track Material Prices

per cent on dimension lumber or an average reduction of 18 per cent in 12 months.

Canadian Prices Firm

In British Columbia, where mills compete with those in Washington and Oregon for export trade and to some extent for our domestic trade, lumbering also had its set backs. However, despite the trouble in China and Japan, which reduced lumber exports to these countries from British Columbia more than 100,000,000 ft. a year since 1936 and despite the war scare in Europe, exports in the first nine months of 1938, totaling 870,318,290 mfbm., exceeded those in the corresponding period of 1937 by approximately 22,000,000 ft. and exceeded those of the corresponding period of 1936 by approximately

100,000,000 ft., and it is probable that the output for the year 1938 was equal to that of 1937. Mill prices on railroad lumber in British Columbia in 1938, as compared with those prevailing in 1937, are shown in the table.

Lumber Prices—British Columbia

	October, 1937 1,000 Bd. Ft.	July, 1938 1,000 Bd. Ft.
Car roofing	\$18.00	\$22.00
Car sheathing	23.00	27.00
Car roofing	20.00	25.00
Car siding	28.00	22.00
Car siding	43.00	27.00
Car siding	48.00	45.00
Car end lining	50.00	50.00
Car lining	45.00	45.00
Car lining	55.00	55.00
Timbers	14.00	14.00
Average	34.45	33.15

As will be seen from the table, prices were better sustained than in the United States and averaged only 3 per cent under those of 1937. A new tariff has recently been negotiated between Canada and the United States which is designed to expand Canadian trade with this country and this is expected to have a stabilizing effect on the future prices in the States but it is not anticipated at this time that the prices of Canadian lumber will fluctuate materially.

Crosstie Prices Vary

It is always difficult to arrive at a satisfactory average of crosstie prices because of the widely varying conditions under which they are bought, as well as the lack of comparability between the ties purchased by different roads. It usually follows that in slack years, ties are available to the roads at reduced prices and this condition prevailed last year. Several railroads paid the same price for ties in 1938 as in the last quarter of 1937 but in most instances the reported prices were from 5 to

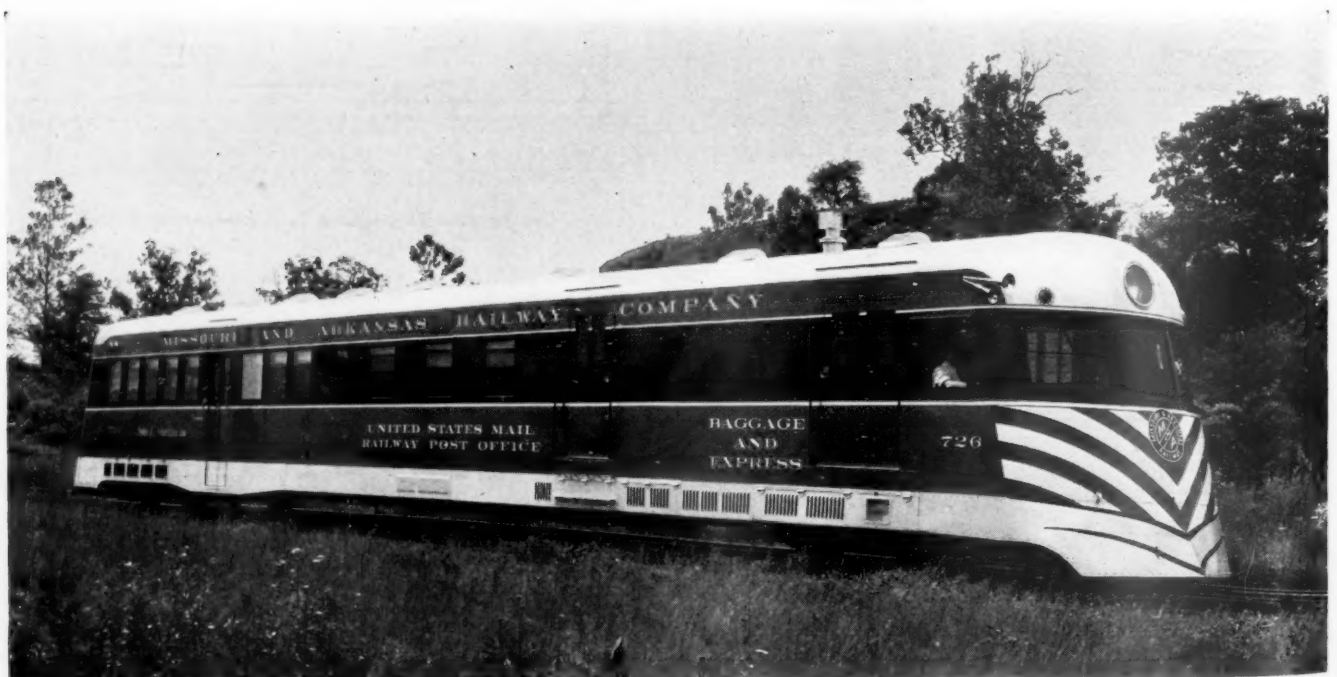
10 cents less per tie. One road reported a decline in fir ties from 63 cents to 50 cents. Another road reduced its pine tie costs during 1938 from 89 cents to 83 cents, while still another road effected a reduction from 56 cents to 41 cents. Typical trends in oak tie costs were 75 cents to 70 cents, 80 cents to 70 cents, \$1.20 to \$1.15 and 68 cents to 53 cents. In Canada No. 1 fir ties are selling for 52 cents, No. 2 fir for 40 cents and No. 1 hemlock for 48 cents.

Miscellaneous Prices Mixed

As compared with October, 1937, the cost of sheet copper to the railroads in the last quarter of 1938, at 11.4 cents per lb., reflected a decline of 28 per cent while pig lead, at 5.3 cents a cwt., showed a decline of 14 per cent. The change in the average cost of boiler lagging and fire brick was from three to five per cent down from the last quarter of 1937. Air brake hose, at 39 cents a foot, was 11 per cent less, manila rope at 16 cents a foot was 13 per cent less and rubber at 13.5 cents a foot was 6 per cent less. Car oil at 14 cents per gal. in the last quarter reflected an increase of five per cent over the corresponding average in 1937. Cotton waste at 5.6 cents per lb. was 30 per cent less; glass at \$5 a box was 10 per cent less; white lead at 8.4 cents per lb. was 15 per cent less and oxygen at 88 cents per 100 cu. ft. was 3 per cent lower. The prices of creosote oil, brick and cement were unchanged from 1937 but incandescent lamps showed a continuation of the downward decline in prices that has prevailed since 1925.

Other details and comparisons of prices will be found in the tables. The tables of commodity prices are based on average prices reported to the *Railway Age* by 13 large railroads in various parts of the country and the figures given are the averages of the prices reported. The high and low figures do not represent the fluctuations in the price trend, but are inserted to show the highest and the lowest prices that were reported during the year by several roads without regard to the period of the year in which they appeared.

* * * *



Two Rail Motor Cars of This Type Were Delivered to the Missouri & Arkansas in June, 1938, by the American Car and Foundry Company

Railway Construction Still Low



Southern Pacific Builds New Line Through Soledad Canyon

Outlook for upturn in business foreshadows an increase during the coming year in providing much needed facilities for handling traffic

By George E. Boyd
Associate Editor

AS was forecast at the beginning of last year, railway construction reached a new low during 1938. At that time business was decreasing, while the decline in railway earnings was relatively greater, with the prospect that both would go still lower. With these conditions confronting the railways, only those projects were being authorized that were of such vital nature that they could not be deferred, and work was continued on the few similar projects that were carried over from the previous year, with the result that railway construction reached an all-time low during the year.

For almost a decade practically no new construction has been undertaken by the railways for the purpose of expanding their plant or replacing obsolete facilities, because earnings have remained at so low a level that it has been impracticable to finance work of any magnitude. Yet during this time the requirements of operation and traffic have changed radically and new methods of operation have been developed, with the result that many of the existing facilities are obsolete and must be replaced, or new facilities must be provided to make the newer methods fully effective. Furthermore, in not a few instances, the lack of up-to-date facilities is preventing the development of still other methods that will make possible greater despatch in the handling of traffic, or that will reduce the cost of operation.

As a result of deferred construction and of the changes that have been made in operating methods, more railway facilities are obsolete today than at any previous time, and the need for a vast program of railway construction and reconstruction has never been so great as at present. With the present favorable outlook for a marked increase in business and the pressing need for additional and better facilities for handling it, the prospect is that there will be a considerable revival of construction activity. With business on a permanently better basis, this activity will increase, for there is now a

suppressed need for a vast program of improvements that will overshadow all former improvement programs.

Beginning with 1936, there has been an unprecedented amount of grade-crossing separation work in all sections of the country, mainly by reason of federal grants to states and municipalities for this purpose. As the original federal appropriations, amounting to \$200,000,000 were exhausted, this construction fell off rapidly as the larger projects were completed during 1937. Subsequent appropriations have been smaller and, in general, the individual projects have been of such magnitude that they could be completed in the year for which they were

Miles of Main Track Built in 1938

	Number of companies building	First track	Second track	Third track	Fourth track	Fifth track	Sixth track	Total
United States								
Illinois	1	0.02	...	...	...	...	...	0.02
California	1	11.54	0.59	...	...	...	...	12.13
New Jersey ...	1	2.12	0.63	...	...	0.91	0.81	4.47
Oregon	1	0.75	...	...	...	...	...	0.75
West Virginia..	2	23.73	...	...	...	...	...	23.73
Total	6	38.16	1.22	...	...	0.91	0.81	41.10

authorized. For this reason, the carry over into 1939 is small. The present indication is that about \$20,000,000 will be available for this type of work in 1939.

New Line Mileage Decreases

It has been noted for many years that the mileage of new lines under construction or completed during any year provides an excellent index of railway construction activities as a whole, and this belief is fully borne out by analysis of construction records over a long period. Confirming this trend, only 38 miles of new lines, the second smallest new mileage of record, were completed in 1938. This compares with 148 miles in 1937, and with 24 miles in 1933, which represents the lowest mileage since 1830,

as will be noted by reference to the table showing the mileage completed year by year since that date. Also confirming the previous statement that general construction activity is indicated by the magnitude of the new-line projects under way, this class of work was practically

Miles of New Line Completed in the United States Since 1830

Year	Miles	Year	Miles
1830	40	1885	3,131
1831	99	1886	8,400
1832	191	1887	13,081
1833	116	1888	7,066
1834	214	1889	5,707
1835	138	1890	5,739
1836	280	1891	4,620
1837	348	1892	4,648
1838	453	1893	3,024
1839	386	1894	1,760
1840	491	1895	1,420
1841	606	1896	1,692
1842	505	1897	2,109
1843	288	1898	3,265
1844	180	1899	4,569
1845	277	1900	4,894
1846	333	1901	5,368
1847	263	1902	6,026
1848	1,056	1903	5,652
1849	1,048	1904	3,832
1850	1,261	1905	4,388
1851	1,274	1906	5,623
1852	2,288	1907	5,212
1853	2,170	1908	3,214
1854	3,442	1909	3,748
1855	2,453	1910	4,122
1856	1,471	1911	3,066
1857	2,077	1912	2,997
1858	1,966	1913	3,071
1859	1,707	1914	1,532
1860	1,500	1915	933
1861	1,016	1916	1,098
1862	720	1917	979
1863	574	1918	721
1864	947	1919	686
1865	819	1920	314
1866	1,404	1921	475
1867	2,541	1922	324
1868	2,468	1923	427
1869	4,103	1924	579
1870	5,658	1925	644
1871	6,660	1926	1,005
1872	7,439	1927	779
1873	5,217	1928	1,025
1874	2,584	1929	666
1875	1,606	1930	513
1876	2,575	1931	748
1877	2,280	1932	163
1878	2,428	1933	24
1879	5,006	1934	76
1880	6,876	1935	45
1881	9,789	1936	93
1882	11,599	1937	148
1883	6,819	1938	38
1884	3,974		

at the minimum at the close of the year, although several projects are under consideration, but are being held in abeyance because of difficulties connected with financing them.

During the 20-year period ending with 1918, the mile-

age of new lines completed annually varied from a maximum of 6,026 in 1902 to a minimum of 721 in 1918, the former being the largest mileage recorded since these records of general railway construction were started. During the 20-year period ending with 1938, the largest mileage was completed in 1928, when 1,025 miles were placed in operation, and the smallest was the 24 miles completed in 1933, the low point in American railway history. It is significant that the average mileage completed year by year during the former two decades was 3,552 while the average for the latter period was only 439. These figures point impressively to the fact that the days of large external development are past and that future expenditures will be made more and more for internal improvements and for the expansion of those facilities that affect the movement of traffic. In this connection, it is of interest that this year the table showing new-line construction in the United States has been expanded to include the mileage of new lines completed during every year since 1830.

Of the total of 38 miles of new lines completed during 1938, the largest single project, and the only one representing an external development, was that of the Virginian, between Simon, W. Va., and Kopperstown, 19.33 miles. The next largest, involving a series of connections at Oakland, Cal., totaling 11.54 miles, was constructed to enable the Southern Pacific to operate its

Miles of New Lines Completed in Canada Since 1904

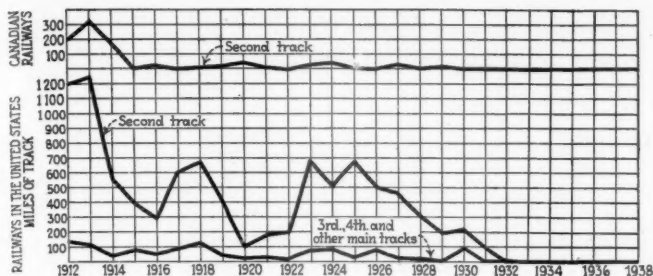
Year	Miles	Year	Miles
1904	316	1922	145
1905	1,181	1923	655
1906	1,007	1924	615
1907	976	1925	414
1908	1,249	1926	335
1909	1,488	1927	310
1910	1,844	1928	723
1911	1,898	1929	841
1912	2,232	1930	385
1913	3,013	1931	250
1914	1,978	1932	121
1915	718	1933	0
1916	290	1934	1
1917	207	1935	2
1918	135	1936	1
1919	433	1937	0
1920	305	1938	101
1921	252		

electric trains over the new Bay bridge between Oakland and San Francisco. The remainder of the mileage consisted mainly of short lines to reach industries or involved construction made necessary by revisions of other facilities.

From 1932 to 1937 inclusive, extension of main track mileage in Canada was confined to a few projects involving line revisions and was offset by corresponding abandonments. In 1938, however, the Canadian National completed a new line 100 miles long from Sennterre,



New Lines Constructed in the United States in 1938 Decreased to 38 Miles. New Lines in Canada Increased to 101 Miles



Three Miles of Multiple Track Completed in 1938

P. Q., a point on the old National Trans-continental, to the Rouyn gold-mining area. This line and a new connection to Vancouver yard, in British Columbia, brought the total mileage for the year to 101 miles.

Multiple Track Mileage

The multiple track mileage completed in 1938 amounted to only 2.94 miles, all of which was constructed in connection with rearrangements of tracks or revisions of other facilities. This stands in strong contrast with the more than 1,200 miles of second track completed in 1913 and as much as 600 to 700 miles in several subsequent years. Likewise, during the period since 1912, the mileage of third, fourth and other main tracks has exceeded 100 miles in each of seven years, but has been negligible since 1932. Since 1925 there has been a general trend toward the restriction of multiple track mileage as a result of developments in the signaling field, which have greatly increased the traffic capacity of existing main tracks, making the construction of ad-

ditional tracks less necessary. With the further extension of centralized traffic control which is probable, multiple-track mileage should remain low for some years to come.

Miscellaneous Construction

Among the larger projects completed or still under construction, the New York Central has continued its West Side improvement in New York at a much-reduced tempo. While this project is nearing completion, it is of such a nature that it must be carried out on an orderly schedule of consecutive items, for which reason it has been spread over a number of years. The electrification of its passenger and freight lines between Perryville, Md., Paoli, Pa., and Harrisburg, by the Pennsylvania, which was started in 1937, was completed during the year.

Also among the larger projects, the Los Angeles Union station was 85 per cent completed at the end of the year and it is expected that it will be ready to open early in the spring of 1939. This project also involves the necessity for relatively large expenditures by the roads using the station, to reach it. The Southern Pacific is also completing major line changes in Soledad canyon and through the Tehachapi Mountain passes where it suffered much damage from flood waters early in 1938.

In Mexico there has been a continuation on a moderate scale of the renewed construction activities which were first in evidence three years ago. During the year four lines were under construction, including the line between Ixcaquixtla and Chachahua, 74 miles, which was completed. Other projects involved principally the enlargement of the shops and installation of modern ma-

Mileage Abandoned 1932 to 1938, Inclusive

	1932	1933	1934	1935	1936	1937	1938	Total
Alaska .....	....	18.27	....	....	....	3.00	195.20	216.47
Alabama	20.82	28.08	36.22	....	42.09	9.95	1.64	138.80
Arizona .....	....	126.51	15.49	17.04	....	....	16.00	175.04
Arkansas	8.17	37.85	51.28	42.35	23.95	83.43	51.10	298.13
California	0.77	185.65	116.00	70.57	30.57	74.23	34.27	512.06
Colorado	26.39	56.57	6.31	84.98	86.30	....	26.29	518.30
Connecticut .....	....	....	....	33.93	....	25.31	50.25	109.49
Delaware .....	....	....	....	....	33.16	....	3.07	36.23
Florida	70.09	69.59	28.13	1.47	165.22	....	12.00	346.50
Georgia	66.41	46.56	126.63	12.34	....	....	85.26	337.20
Idaho	15.41	....	4.63	46.78	16.00	....	....	82.82
Illinois	54.83	38.30	160.82	13.90	32.06	87.42	29.41	416.74
Indiana	14.80	25.66	....	69.70	0.12	....	....	110.28
Iowa	53.12	79.51	52.44	83.32	208.75	14.44	120.58	612.16
Kansas .....	....	128.97	162.64	236.85	51.33	21.04	....	600.83
Kentucky	78.17	74.27	22.89	7.86	....	12.81	14.58	210.58
Louisiana	45.35	35.94	37.48	8.96	6.50	11.46	60.67	206.36
Maine	8.50	13.95	71.39	8.16	....	35.97	12.84	150.81
Maryland	1.00	....	....	25.60	....	3.75	20.23	50.58
Massachusetts	1.40	....	....	33.37	....	33.26	21.82	89.85
Michigan	201.99	51.05	71.39	166.20	40.16	64.65	116.65	712.09
Minnesota	91.07	12.94	53.37	50.93	31.94	23.18	32.91	296.34
Mississippi	24.10	33.50	85.57	....	....	....	....	143.17
Missouri	53.17	25.51	202.65	118.98	48.47	....	91.48	540.26
Montana	3.80	....	....	18.37	10.31	29.28	....	61.76
Nebraska	15.21	45.39	4.87	....	....	....	14.66	80.13
Nevada .....	....	....	26.27	0.31	....	....	214.71	241.29
New Hampshire	25.46	....	5.90	63.92	28.61	16.99	28.40	169.28
New Jersey .....	....	62.58	21.38	....	60.57	6.32	1.14	151.99
New Mexico .....	....	....	41.10	48.02	....	....	....	89.12
New York	58.32	4.14	30.82	30.58	57.00	29.33	201.12	411.31
North Carolina	22.24	53.10	18.50	10.00	11.39	25.17	53.82	194.22
North Dakota .....	....	....	....	....	16.36	....	3.56	19.92
Ohio	35.43	17.81	....	18.77	66.47	24.08	3.16	165.72
Oklahoma .....	....	9.24	79.01	....	8.60	15.95	108.87	221.67
Oregon	25.92	12.31	7.75	13.00	133.17	....	0.15	192.30
Pennsylvania	29.75	39.33	77.60	58.64	105.37	33.58	86.63	430.90
Rhode Island .....	....	....	....	....	....	16.33	0.58	16.91
South Carolina	44.05	....	1.54	76.50	25.00	15.80	8.60	171.49
South Dakota .....	....	....	24.04	26.65	16.43	....	23.33	90.45
Tennessee	74.01	39.81	41.23	64.15	54.84	47.94	2.60	324.58
Texas	107.10	188.82	126.13	77.81	39.12	44.63	23.96	607.58
Utah	19.71	3.05	16.19	....	....	6.88	14.70	60.53
Vermont .....	....	33.22	....	....	1.00	8.75	26.38	69.35
Virginia	112.89	51.69	4.80	21.74	....	4.45	47.46	243.03
Washington	16.36	55.86	12.01	88.35	12.69	10.44	30.10	225.81
West Virginia	1.36	77.49	26.08	12.13	21.10	8.85	....	147.01
Wisconsin	24.90	93.14	124.45	39.65	38.18	59.47	6.78	386.57
Wyoming .....	....	....	....	41.07	....	....	....	41.07
Total	1,452.07	1,875.66	1,995.00	1,842.95	1,522.84	1,139.60	1,896.96	11,725.08

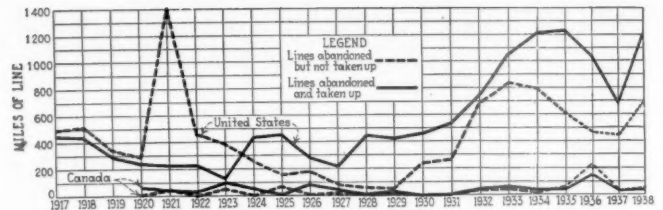
chine tools at Aguascaliente, and the replacement of light bridges with heavier spans.

Abandonments Again Exceed 1,000 Miles

There was a sharp increase in the mileage of lines abandoned during the year, the total of 1,897 miles being the second largest of record, this also being the seventh consecutive year and the eighth time that abandonments have exceeded 1,000 miles. This compares with 1,626 miles abandoned in 1921, 1,140 miles in 1937, 1,876 in 1933 and 1,995 in 1934, the latter being the maximum of record for any year. The total abandonments for 1938 are 1,859 miles greater than the mileage of new

Miles of Lines Abandoned in the United States Since 1917			
1917	942	1928	512
1918	959	1929	475
1919	637	1930	694
1920	536	1931	795
1921	1,626	1932	1,452
1922	677	1933	1,876
1923	513	1934	1,995
1924	693	1935	1,843
1925	606	1936	1,523
1926	457	1937	1,140
1927	282	1938	1,897

lines completed during the year, this difference between new-line construction and abandonments having been exceeded only once, in 1934



Abandonments in United States Second Highest in History. Those in Canada Increased to 99 Miles

The largest single abandonment was that of the Copper River & North Western, involving 195.20 miles of line, between Cordova, Alaska, and Kennecott. The next largest single abandonment was that of the Nevada Central, 92.30 miles, from Battle Mountain, Nev., to Austin; while the Eureka Nevada came third with 88 miles. It is significant that each of these abandonments involved an entire railway, as did that of the Wisconsin & Michigan, 70 miles. The abandonments reported in any year include all lines abandoned permanently during the year regardless of whether the tracks have been taken up at the end of the year, and are not included in later years when the tracks of the latter lines are actually taken up.

Abandonments were not recorded prior to 1917, for the few lines that were discontinued from time to time were unimportant and usually in sparsely populated sec-

Lines Abandoned in the United States and Canada in 1938

United States		Lines abandoned and taken up miles	Lines abandoned but not yet taken up miles	United States		Lines abandoned and taken up miles	Lines abandoned but not yet taken up miles
Baltimore & Eastern				Leadville, Colo., to Penrose Mine		0.77	
Vienna, Md., to Mardella Springs			2.95	Acme, Tex., to Agatite		1.51	
Easton Jct., Md., to Preston			9.62	Trinidad, Colo., to Sopris			3.92
At Ocean City, Md.			0.36	Copper River & Northwestern			195.20
Queenstown, Md., to Centerville			5.37	Cordova, Alaska, to Kennecott			
McDaniel, Md., to Clairborne			1.93	Denver & Rio Grande Western			5.41
Baltimore & Ohio				Reliance Jct., Colo., to Ojo			
Neffs, Ohio to St. Clairsville		3.16		Detroit, Caro & Sandusky			
Ralphton, Pa., to Friedans		8.12		Peck, Mich., to Roseburg		6.36	
Boston & Maine				Duluth, South Shore & Atlantic			
South Ashburnham, Mass., to Ashburnham		2.13		Keweenaw Bay, Mich., to Alston		16.04	
Franklin, N. H., to Bristol		10.33		Eureka Nevada			
Wing Road, N. H., to Fabyan		12.30		Eureka, Nev., to Palisade		88.00	
Bretton Woods, N. H., to Base Station		5.77		Erie			
Caddo & Choctaw				At Moosic, Pa.		1.02	
Rosboro, Ark., to Cooper Junction		12.67		At Bradford, Pa.		0.50	
Carolina & Northwestern				At Edgewater, N. J.		0.08	
Lenoir, N. C., to Edgemont		21.30		Fonda, Johnstown & Gloversville			
Central Arizona				Gloversville, N. Y., to Schenectady		35.00	
Flagstaff, Ariz., to Fulton		16.00		Gloversville, N. Y., to Fonda		9.00	
Central of Georgia				Ft. Smith, Subiaco & Rock Island			
Metter, Ga., to Brewton			47.26	Dardanelle, Ark., to Scranton		24.51	
Central of Vermont				Gulf Coast Lines			
Essex Jct., Vt., to Cambridge Jct.		22.01		Shadyside, La., to Patterson		8.54	
Between Essex Jct., Vt., and Cambridge Jct.			3.75	Gulf, Colorado & Santa Fe			
Chicago & North Western				Ladonia, Tex., to Honey Grove		11.70	
At Cascade, Mich.		0.06		Davis, Okla., to Sulphur			9.27
At Anamosa, Iowa		1.82		Hobart Southern			
Crystal Falls, Mich., to Amasa			13.91	Hobart Mills, Cal.		6.00	
At Mission Hill, S. D.			0.55	Illinois Terminal			
At Hitchcock, S. D.			0.35	Bells, Ill., to North Edwardsville		2.39	
Buffalo Gap, S. D., to Hot Springs			14.32	Kenwood, Ill., to Champaign		2.93	
*At Central City, S. D.			0.14	Lehigh & New England			
Chicago, Burlington & Quincy				Saylorsburg Jct., Pa., to Saylorsburg			5.15
Koyle, Iowa, to Cainsville, Mo.		20.59		Lehigh Valley			
Chicago, Milwaukee, St. Paul & Pacific				Canastota, N. Y., to Camden		20.16	
Turkey River Jct., Iowa, to West Union		58.25		Horseheads, N. Y., to Van Etten		19.00	
Eldridge Jct., Iowa to Long Grove		3.15		At Shepton, Pa.			0.34
Menno, S. D., to Scotland		7.97		At Aldene, N. J.			0.73
Chicago, Rock Island & Pacific				At Jersey City, N. J.			0.33
Ola, Ark., to Dardanelle		13.92		Long Island			
Evans, Iowa, to Knoxville		20.42		Port Jefferson, N. Y., to Wading River			11.00
Pittsburg, Okla., to Frisco Jct.		84.21		Manhattan Beach Jct., N. Y., to Sheepshead Bay			2.85
Coalgate Jct., Okla., to Coalgate		1.60		Louisville & Nashville			
Ruskin, Neb., to Nelson			12.40	Russellville, Ky., to Adairville			11.48
Muscataine, Iowa, to Nichols			16.21	Louisiana Southern			
Lone Tree, Iowa, to Iowa Jct.			5.32	Braithwaite, La., to Pointe-a-la-Hache			28.20
Frisco Jct., Okla., to Ardmore			13.79	Poydras Jct., La., to Reggio			8.70
Clarendon & Pittsford				Maine Central			
Center Rutland, Vt., to Rutland		0.62		Crowleys Jct., Me., to Leeds Jct.			10.61
Cliffside				Waukeag, Me., to Mt. Desert Ferry			2.23
Flat Rock Jct., N. C., to West Henrietta		1.43		Marianna & Blountstown			
Cliffside, N. C., to Matheny		2.08		Flowers, Still and Myron branches, Fla.		12.00	
Colorado & Southern				Marion & Southern			
Sheridan Jct., Colo., to Lakeland		3.45		Marion, S. C., to West Marion		2.70	
Hill Top Jct., Colo., to Leavick		11.33					

Lines Abandoned in the United States and Canada in 1938 (Continued)

United States		Lines abandoned and taken up miles	Lines abandoned but not yet taken up miles	United States		Lines abandoned and taken up miles	Lines abandoned but not yet taken up miles
Maxton, Alma & Southbound				St. John & Ophir			
Alma, N. C., to Rowland		15.15		St. John, Utah, to Ophir		8.56	
Minneapolis & St. Louis				St. Louis-San Francisco			
Berkeley, Iowa, to Angus		4.83		Chicopee, Mo., to Grandin			19.32
At Kalo Jct., Iowa		0.58		Williamsville, Mo., to Hunter			21.30
Minneapolis, Red Lake & Manitoba				Dillworth, Ala., to Sipsey			1.64
Bemidji, Minn., to Redby			32.35	St. Louis Southwestern			
Minneapolis, St. Paul & Sault Ste. Marie				Wyatt, Mo., to Birds Point			5.27
Owen, Wis., to Curtiss		6.78		Shearwood			
Fairmount, N. D., west of		3.56		Hogan, Ga., to Egypt		38.00	
At Milford Mine, Minn.		0.56		Shelby County			
Missouri Southern				Shelbina, Mo., to Shelbyville		8.50	
Himont, Mo., to Brushy			5.00	Shelby Northwestern			
Montour				Shelbyville, Mo., to Novelty		21.50	
Groveton, Pa., to Moon Run			5.00	Shreveport, Houston & Gulf			
Nevada Central				Prestridge, Tex., to Manning		10.75	
Battle Mountain, Nev., to Austin		92.30		Southern			
Nevada Northern				Burgin Jct., Ky., to Burgin		3.10	
At Ely, Nev.		0.41		Warrenville, S. C., to Clearwater		5.90	
New York, New Haven & Hartford				Holston River, Tenn., to Morristown		2.60	
At New Haven, Conn.		0.23		Southern Pacific			
West Haven, Conn., to Orange		4.77		Caruthers, Cal., to Hardwick		11.88	
State Line, N. Y., to Millerton		1.82		Duarte, Cal., to Rivas		0.69	
Lakeville, Conn., to State Line, N. Y.		2.90		At Portland, Ore.		0.15	
State Line, N. Y., to Rhinecliff		41.80		Gary, La., to Barba		1.28	
P. & E. Jct., N. Y., to Silvernails		3.38		Clausen, La., to South Bend		9.45	
N. D. & C. Jct., N. Y., to Pine Plains		0.69		Cleon, La., to Atchafalaya		4.50	
P. & E. Jct., N. Y., to Ancramdale		4.90		Tonopah Jct., Nev., to Benton, Cal.			49.70
At Boston Corners, N. Y.		0.35		Union Pacific			
P. & E. Jct., N. Y., to Stissing Jct.		4.88		Silica, Neb., to St. Thomas		2.26	
Stissing Jct., N. Y., to Hopewell Jct.		26.23		Five-Mile Pass, Utah, to Toplift		6.14	
Stissing Jct., N. Y., to Poughkeepsie Jct.		20.06		Ventura County			
West Winsted, Conn., to Canaan		15.12		South Patterson Jct., Colo., to North Patterson			1.41
Griffins, Conn., to Tariffville, to Agawam Jct., Mass.		17.01		Virginia Central			
Hopkinton, Mass., to Ashland			4.62	Orange, Va., to West Fredericksburg		37.00	
West Bridgewater, Mass., to Eastondale			3.50	Wabash			
West Hanover, Mass., to Hanover			4.56	Sullivan, Ill., to Stewardson			24.09
At Wickford, R. I.			0.58	Williamsport & North Branch			
Westfield, Conn., to York Hill Quarry			4.88	Hall's, Pa., to Satterfield		44.40	
Collinsville, Conn., to High Street Jct.			0.82	Bernice Jct., Pa., to Bernice		1.60	
Winsted, Conn., to High Street Jct.			11.53	Wisconsin & Michigan			
Norfolk & Western				Iron Mountain, Mich., to Bagley Jct., Wis.		62.00	
Near Abingdon, Va.		0.95		Oregon Jct., Mich., to South Norway		5.00	
Near Chattaroy, Va.		0.43		Terminal tracks, South Norway, Mich.			0.50
Lewis Creek branch			9.08	Terminal tracks, Menominee, Mich.			2.50
Norfolk Southern				Yadkin			
West End, N. C., to Jackson Springs		4.33		Albemarle, N. C., to Norwood		9.53	
Northern Pacific				Total		1,212.09	684.87
Granger, Wash., to Sunnyside Jct.		3.20		CANADA			
Pennsylvania				Canadian National			
Vener Jct., Mich., to Merritt		10.28		LaJemmerais, P. Q., to Mont Mills		6.00	
Newark Center, Del., to Thompson			3.07	Loretteville, P. Q., to Stoneham		9.95	
Clover Creek branch			2.17	Dombourg, P. Q., to St. Marc		10.56	
At Moshannon, Pa.			0.80	Grand River, Ont., to Bront County Siding		3.57	
At Leechburg, Pa.			0.63	At Vancouver, B. C.		0.29	
Puget Sound & Cascade				Dombourg, P. Q., to St. Marc			11.69
Mt. Vernon, Wash., to Potts			26.90	Port Perry, Ont., to Cresswell			13.00
Quaker Town & Bethlehem				Twins City Jct., Ont., to North Lake			33.66
Bethlehem, Pa., to Quakertown		15.00		Great Northern			
Reading				Colebrook, B. C., to Ladner		10.20	
Brockton, Pa., to Brockville		0.89		Total		40.57	58.35
Reading Pa., to Tulpehocken Pumping Station.		1.01					

tions, generally logging roads or those serving mines, while they occurred so infrequently as to attract little attention. Beginning with 1917, however, in which year 942 miles of main lines were abandoned, abandonments have continued on a large scale ever since, the mileage abandoned in individual years having ranged from 282 miles in 1927 to 1,995 miles in 1934. During the 22-year period beginning with 1917, a total of 22,109 miles of lines have been abandoned, while during the same period only 10,472 miles of new lines have been constructed, leaving a net decrease of 11,637 miles of road.

Of equal interest with the mileage abandoned by individual roads and the total for all roads, is the distribution of these abandonments by states, for the states themselves are vitally concerned. During the seven years ending with 1938, a total of 11,725 miles were abandoned in the 48 states and Alaska. For the seven-year period Michigan leads with 712 miles, Iowa is second with 612 miles and Texas ranks third with abandonments aggregating 608 miles. By regions, the abandonments during these seven years have been: New England states, 606

miles; North Atlantic states, 1,081 miles; southeastern states, 2,257 miles; middle-western states, 3,381 miles; northwestern states, 814 miles; southwestern states, 2,379 miles; and the Pacific Coast states, 991 miles.

Prior to 1932 the abandonments in Canada and Mexico had been negligible. In 1932 and 1933, however, the Canadian roads abandoned a total of 282 miles. During 1934 there was a further abandonment of 55 miles and in 1935 these figures were increased by 125 miles. In 1936 there was a sharp increase to 399 miles, the largest of any year of record. During 1937 the abandonments in this country aggregated 67, while those for 1938 were 99 miles. No abandonments have been recorded for two years by the Mexican roads, although operation is still suspended on several small roads serving mining interests.

Following is a detailed report by roads of construction projects completed or still in progress during 1938, the individual cost of which approximates or exceeds \$100,000, except grade separations which are included regardless of cost:

Railway Construction in the United States

(Figures in parenthesis indicate percentage of completion at the end of 1938. In grade-crossing elimination, all work is being carried out with federal or state funds unless otherwise indicated.)

Alaska

Important Work Undertaken: Replacement of wood bridge over Matanuska river with steel spans, mile post 148.3, \$123,000 (96).

Ann Arbor

Grade Crossing Elimination: Subways: U. S. route 16, Howell, Mich., \$105,000 (100). State route 20, Mt. Pleasant, Mich., \$95,000 (50).

Atchison, Topeka & Santa Fe

Grade Crossing Elimination: Overcrossings: Medill, Mo., (100). Topeka, Kan., (100). Salina, Kan., (50). Olathe, Kan., (10). Purcell, Okla., (100).

Subways: Moon, Ill., (50). Platte avenue, Colorado Springs, Colo., (10). Fourth avenue, Ft. Sumner, N. M., (25). Wilson way, Stockton, Cal., (100).

Important Work Undertaken: Mechanical terminal facilities, Chicago (100). Line change, Pinole tunnel, Pinole, Cal., (100). Additional signal protection, Bakersfield-Richmond, Cal., (100).

(Panhandle & Santa Fe) **Grade Crossing Elimination:** Subways: Puliam street, San Angelo, Tex., (10).

Atlanta, Birmingham & Coast

Grade Crossing Elimination: Overcrossings: Fulton county, Ga., mile post 324, \$25,000 (100). Ideal, Ga., \$28,000 (100). Musselwhite, Ga., \$25,000 (100). Alma, Ga., \$27,000 (100). Wadley, Ala., \$23,000 (100).

Subways: Byromville, Ga., \$35,000 (100). Reeders Gap, Ala., \$50,000 (100).

Reconstruction of concrete steel bridge replacing old timber structure, Anderson avenue, Atlanta, Ga., \$26,000 (100).

Atlantic & Yadkin

Grade Crossing Elimination: Relocation of highway to eliminate four grade crossings U. S. route 52, Rural Hall, N. C., to Pilot Mountain (100).

Atlantic Coast Line

Grade Crossing Elimination: Overcrossings: Ahoskie, N. C., \$50,000 (100). Yemassee, S. C., \$67,000 (100). Savannah, Ga., Central Junction, joint with Atlantic Coast Line and Seaboard Air Line, \$210,000 (75). Ogeechee road near Telfair Junction, Savannah, Ga., \$73,820 (100). Court street, Quitman, Ga., \$156,460 (100). Thomasville, Ga., \$167,640 (100). Ways, Ga., \$150,000 (under contract). Cairo, Ga., \$50,000 (work started). West Bainbridge, Ga., \$35,000 (work started). Ruskin, Fla., \$90,000 (100). Union Hill crossing near Corcoran, Ala., \$57,100 (100).

Subways: Smithfield, N. C., \$101,000 (100). Fayetteville, N. C., \$57,000 (100). Hinson avenue, Haines City, Fla., \$200,000 (work started).

Reconstruction of highway underpass, Dunlop, Va., \$60,549 (100). Reconstruction of overhead bridge Ogeechee road near Union Junction, Savannah, Ga., \$51,080 (100).

Baltimore & Ohio

Grade Crossing Eliminations: Overcrossings: Tift street viaduct, Bufalo, N. Y., joint with Erie, New York Central, Lehigh Valley and other roads, \$995,000 (100). Singler, Md., \$146,000 (80). Beltsville, Md., \$70,000 (90). Rockville, Md., \$220,000 (100). Kensington, Md., \$215,000 (100). Hancock, W. Va., \$900,000 (40). Fetterman, W. Va., \$295,000 (90). Stoyestown, Pa., \$230,000 (100). Main street, Akron, Ohio, joint with Erie and Pennsylvania, \$1,490,000 (90). Piedmont, Ohio, \$100,000 (90). Willow, Ohio, \$425,000 (10). Hillsdale, Ind., \$150,000 (100). Track elevation between Great Kills-Huguenot, Staten Island, N. Y., joint with state and city, \$2,136,000 (5). Laramie avenue, Chicago, Ill., joint with Chicago Great Western, \$640,000 (40).

Subways: Dorsey, Md., \$135,000 (100). Clarksburg, W. Va., \$205,000 (100). McGonigle, Ohio, \$200,000 (90). E. St. Louis, Ill., \$170,000 (100).

Relocation of Highway: Smithburg, W. Va., \$154,000 (100). Curwensville, Pa., \$155,000 (100).

Reconstruction of Grade Crossing Structure: Meade, Md., \$36,500 (100). Langdon, D. C., \$85,000 (25). Mt. Jewett, Pa., \$145,000 (100). Critchfield, Pa., \$42,000 (100). Somerset, Ohio, \$40,500 (100). Liberty, Ind., \$135,000 (100). Akron, Ohio, \$122,000 (93).

Important Work Undertaken: Reconstruction of Pier No. 12, \$394,000 (100). Howard street extension, Baltimore, Md., \$293,000 (95). Relocation of line between Beach City, Ohio and Mineral City and 1½ miles on the C. T. & V. branch near East Sparta, Ohio, in connection with the flood control project, Muskingum Conservancy district, \$1,400,000 (100). Electric interlocking plant, Chicago, \$105,000 (100).

Belt Railway of Chicago

Grade Crossing Elimination: Viaduct, 103rd street, Chicago, \$98,200 (100).

Important Work Undertaken: Changing grades in Classification yard, Clearing, Ill., \$1,463,000 (100).

Boston & Main

Grade Crossing Elimination: Overcrossings: Newbury, Vt., \$75,000 (100). Ashland, N. H., \$175,000 (100). Rollinsford, N. H., \$80,000 (50). Main street, Tewksbury, Mass., \$150,000 (50). Main street, West Valley Falls, N. Y., \$93,000 (50).

Canadian National (Lines in United States)

Subways: Seven Mile road and John R. street, Detroit, Mich., Davison avenue, Detroit, Mich., Grade separation at Outer Drive (Lantz avenue), Detroit, Mich.

Reconstruction of Existing Grade Separation Structures: Subway at South Ashland avenue, Chicago, Ill.

Canadian Pacific (Lines in United States)

Grade Crossing Elimination: Overcrossing, Lyndonville, Vt., \$16,500 (100).

Central of Georgia

Grade Crossing Eliminations: Overcrossings: Central Junction near Savannah, Ga., joint with Seaboard Air Line and Atlantic Coast Line, \$210,000 (100). Pooler, Ga., \$63,750 (100). Oconee street, Athens, Ga., \$23,000 (25). Lorane, Ga., \$20,080 (100). Geneva, Ga., \$23,000 (100). LaGrange street, Greenville, Ga., \$18,190 (100).

Subways: Milledgeville, Ga., \$51,040 (100). Clisby street, Macon, Ga., \$27,400 (100). 4th avenue, Columbus, Ga., \$120,000 (100). Grand avenue and 55th street, Birmingham, Ala., \$100,775 (railway portion) (60).

Important Work Undertaken: Fertilizer warehouse with elevating and conveying equipment, Savannah, Ga., \$134,000 (100).

Central of New Jersey

First Track: Bayonne Port Terminal, Bayonne, N. J., 1.56. Relocation of track, Bayonne, N. J. in connection with track elevation, Elizabethport, N. J., 0.56.

Second Track: Elizabethport, N. J., 0.63.

Fifth Track: Elizabethport, N. J., 0.91.

Sixth Track: Elizabethport, N. J., 0.81.

Grade Crossing Eliminations: Overcrossings: Lehighon, Pa., \$542,000 (100). Lakehurst, N. J., \$100,000 (100). Wilson avenue, Newark, N. J., \$340,000 (100).

Subways: Track elevation to eliminate 13 street crossings at grade and 2 railway crossings at grade, Elizabethport, N. J., \$5,000,000 (97).

Important Work Undertaken: New draw span over Big Shark river, Avon-Belmar, N. J., \$270,000. Reconstruction of overhead highway bridge, Annandale, N. J., \$133,000 (100).

Chesapeake & Ohio

First Track: Van. W. Va., 4.40 miles.

Grade Crossing Eliminations: Overcrossings: Newport News, Va., \$95,456 (100). Buchanan, Va., including bridge over James river, \$189,000 (100). Russell, Ky., \$185,000 (100). Maysville, Ky., \$144,900 (100). Enterprise, Ohio, \$50,000 (100). Winifrede Junction, W. Va., \$85,850 (100). Riverton, Ky., \$100,000 (none). Columbus, Ohio, \$70,000 (none).

Subways: First street, Huntington, W. Va., \$180,000 (100). Fifth street west, Huntington, W. Va., \$20,000 (100). Kenova, W. Va., \$149,600 (100). Russell, Ky., \$20,000 (100). Newport, Ky., \$343,108 (100). Olentangy boulevard, Columbus, Ohio, \$152,000 (100). Fifth avenue, King avenue and diversion of Chambers road, Columbus, Ohio, \$453,558 (100). Paintsville, Ky., \$60,000 (started). Goodale street, Columbus, Ohio, \$145,000 (started).

Relocation of Highways: Trevilian, Va., to Gordonsville, \$35,000 (100). Danville, W. Va., to Madison, \$110,000 (100).

Reconstruction of Grade Crossing Structures: South Side bridge, Charleston, W. Va., \$647,000 (100). Richmond, Ind., \$73,000 (100).

Important Work Undertaken: Additional storage warehouses, Newport News and Morrison, Va., \$186,700 (100). Six additional storage warehouses, Morrison, Va., \$175,900 (100). Raising track and placing riprap, various points to afford flood protection; revision of alignment and grade between Joshua Falls and Galts Mill; James river line, Richmond, Va., to Clifton Forge, \$522,445 (100). Double track bridge on new alignment, over North river; extension of second track, Balcony Falls, Va., \$242,000 (100). Additional yard and tracks, South Charleston, W. Va., \$146,960 (100). Revision of line and strengthening of roadbed, Buchanan, Ky., \$129,850 (100). Widening and repair of bridge, Garrison, Ky., \$114,800 (100). Two additional tracks in eastbound yards, extension of yard and hump tracks and raise grade of hump tracks, Walbridge, Ohio, \$291,344 (100). Fire protection and additional equipment, Pier 9, Newport News, Va., \$450,000 (100). Additional yard tracks, South Charleston, W. Va., \$146,960 (96). Extension of yard tracks, Martin, Ky., \$105,000 (100). Improvements to passenger station, Charleston, W. Va., \$100,331 (1).

Cheswick & Harnar

Grade Crossing Elimination: Overcrossing: River Valley, Pa., joint with Bessemer & Lake Erie, \$3,200 (100).

Chicago & Eastern Illinois

Important Work Undertaken: Construction of coach shop, Danville, Ill., \$200,000 (100).

Chicago & Illinois Midland

Grade Crossing Elimination: Revision of Highways: Consolidate two crossings, close one, Old Salem, Ill., \$4,050 (50). Close one crossing Tice, Ill., \$5,100 (100). Build short section new road, close two crossings, Tice, Ill., \$1,100 (100). Close two crossings, Pawnee, Ill., \$3,200 (50). Close one crossing, Taylorville, Ill., \$25 (100). Close two crossings, Kilbourne, Ill., \$1,800 (50).

Chicago & North Western

First Track: Spring Valley, Ill., .02.

Grade Crossing Elimination: Overcrossings: U. S. Highway 14, Volga, S. D., \$59,500 (100). Powder River, Wyo., \$28,770 (100). State Highway No. 8, Crowell, Neb., \$68,000 (100). Broad street viaduct, Fremont, Neb., \$237,000 (100).

Subways: U. S. Highway 69 at Grand avenue, Ames, Iowa, \$239,000 (100). Track elevation, 1¼ miles, to eliminate three grade crossings, Kenosha, Wis., \$400,000 (50). Lombard, Ill., \$80,000 (100). Elmhurst, Ill., \$128,000 (100).

Revision of Highway: South Chase avenue, Milwaukee, Wis., \$536,490 (100). Relocation of highway and construction of new bridge at Neshkoro, Wis., \$100,000 (100).

Reconstruction of Grade Crossing Structures: S. A. Route No. 145, Proviso, Ill., \$45,000 (100). W. Railroad avenue, Evanston, Ill., \$150,000

(100). Irving Park boulevard, Proviso, Ill., \$45,000 (100). Grand avenue, Chittenden, Ill., \$100,000 (90).
Important Work Undertaken: Replacing wooden bridge with steel spans, \$123,600 (100).

Chicago & Western Indiana

Grade Crossing Elimination: Overcrossings: Viaduct, 103rd street, Chicago, \$101,800 (100).
Important Work Undertaken: Installation of three 502-hp. boilers, with forced draft and stokers, 49th street power house, Chicago, \$135,000 (100).

Chicago, Burlington & Quincy

Grade Crossing Elimination: Overcrossings: Cicero, Ill., \$17,000 (100). Cicero, Ill., \$700,000 (60). Montgomery, Ill., \$6,000 (100). Bushnell, Ill., \$125,000 (100). Emerson, Iowa, \$100,000 (100).
Subways: Tingley, Iowa, \$9,000 (60). Lincoln, Neb., \$100,000 (90). Brush, Colo., \$47,000 (90). Denver, Colo., \$230,000 (100).

Chicago Great Western

Grade Crossing Elimination: Subways: Trunk Highway 14, Allison, Iowa, \$25,000 (100). County Highway, McClelland, Iowa, \$35,000 (100).

Chicago, Indianapolis & Louisville

Grade Crossing Elimination: Overcrossings: Gosport, Ind., \$60,000 (100).

Chicago, Milwaukee, St. Paul & Pacific

Grade Crossing Elimination: Overcrossings: Bensenville, Ill., \$45,000 (100). Rock Valley, Iowa, \$50,000 (100). Herndon, Iowa, \$30,000 (100). Manilla, Iowa, \$35,000 (100). W. 70th street, Milwaukee, Wis., \$50,000 (5). Lincoln avenue, Stambaugh, Mich., \$30,000 (35). U. S. Highway 16 and 61, La Crescent, Minn., \$85,000 (3). Reno, Minn., \$30,000 (3). 3rd street, Bristol, S. D., \$50,000 (95). 1st avenue, Bowman, N. D., \$50,000 (40). U. S. Highway 10, Three Forks, Mont., \$85,000 (100). U. S. Highway 89, Ringling, Mont., \$85,000 (5). Logan street, Harlowton, Mont., \$100,000 (5). Seasons, Ida., \$56,000 (100).
Subways: Libertyville, Ill., \$200,000 (5). Austin avenue, Chicago, Ill., \$1,210,000 (100). Wrightwood avenue, Chicago, \$255,000 (20). Sac City, Iowa, \$20,000 (100). Federal avenue, Mason City, Iowa, \$35,000 (100). N. 2nd avenue, Washington, Iowa, \$75,000 (25). Sturtevant, Wis., \$220,000 (25). Hazelhurst, Wis., \$65,000 (100). Waterloo, Wis., \$75,000 (100). Sparta, Wis., \$100,000 (5). Riton, Wis., \$65,000 (95). Meridian street, N. Puyallup, Wash., \$60,000 (30). Maple Valley road, Renton, Wash., \$50,000 (15). Lakeview highway, Allison, Wash., \$85,000 (50). Rochester, Wash., \$50,000 (10).
Relocation of Highways: Day County, S. D., \$18,000 (60). Grant County, S. D., \$90,000 (99).

Chicago, Rock Island & Pacific

Grade Crossing Elimination: Overcrossings: Highway U. S. 81, Wichita, Kan., \$177,000 (100). State Highway 13, Adrian, Tex., \$18,000 (100). State Highway 83, Walnut, Iowa, \$75,000 (100). State Highway 117, Stinnet, Tex., \$15,000 (10).
Subways: Highway U. S. 81, Enid, Okla., \$110,000 (100). Broadway street, Kingfisher, Okla., \$283,000 (100). Burlington street, Fairfield, Iowa, \$125,000 (100). Florida street, Memphis, Tenn., \$100,000 (100). 48th street, Lincoln, Neb., \$175,000 (10). U. S. 183, Selden, Neb., \$64,000 (75). State Highway 1, Washington, Iowa, \$150,000 (15).
Reconstruction of Existing Grade Separation Structures: Walnut street viaduct, Oklahoma City, Okla., \$90,000 (100). 6th street subway, Amarillo, Tex., \$60,000 (100).
Important Work Undertaken: Reconstruction of two piers and erection of one 200-ft. through span over Salt Fork of Arkansas river, \$150,000 (100). Revision of grade for two miles and construction of new bridge over East Bureau creek, Bureau, Ill., \$172,000 (100). Revision of alignment and construction of five 250-ft. deck truss spans over Cimarron river, Kismet, Kan., \$1,500,000 (30).
New Line Under Construction: Relocation of track, Kismet, Kan., to Havne, 8.42.
New Line Under Survey: Columbus Junction, Iowa to Trenton, Mo., 145.00 miles.

Chicago, St. Paul, Minneapolis & Omaha

Grade Crossing Elimination: Subway: U. S. Highway 2. Dauby, Wis., \$59,168 (100).

Cincinnati Union Terminal Company

Important Work Undertaken: Replacement of untreated piles and caps with creosoted material. Southwest connection, Cincinnati Union Terminal, Cincinnati, Ohio, \$100,500 (100).

Clinchfield

Grade Crossing Elimination: Overcrossings Logan, N. C., \$19,060 (100).
Subways: St. Paul, Va., \$87,290 (75). Hemlock, Tenn., \$40,307 (100).

Colorado & Southern

Grade Crossing Elimination: Overcrossings: Colorado State Highway No. 12, Beshoar, Colo., \$60,000 (100).
Subways: 46th avenue, Denver, Colo., \$210,000 (100).
Important Work Undertaken: Brick warehouse, Denver, Colo., \$146,843 (100).

Cumberland & Pennsylvania

Grade Crossing Elimination: Relocation of road, Morrisons, Md., \$17,000.

Delaware & Hudson

Grade Crossing Elimination: Overcrossings: South Grand, Grove, East and East Main streets, Cobleskill, N. Y., \$637,725 (100).
Subways: West Maple and Hamilton streets, Corinth, N. Y., \$91,900 (100). Beckers and Bunkers Crossings, Central Bridge, N. Y., \$173,200 (100). Coventry Road, Depot Hill and station crossing, Nineveh-Harpursville, N. Y., \$198,450 (100).

Reconstruction of Grade Crossing Structure: Bridge 2.88, Menands, N. Y., \$218,400 (100). Bridge 69.29, Lake George, N. Y., \$36,500 (100). Bridge RO 88.86, Hydeville, Vt., \$26,170 (100).

Delaware, Lackawanna & Western

Grade Crossing Elimination: Subways: Transit road, Depew, N. Y., joint with the Erie, Lehigh Valley and New York Central (100).
Relocation of Highway: High Street, Summit, N. J., includes over crossing (100). State Route No. 166, Portland, Pa., to Stateford, Pa. (100).
Reconstruction of Grade Crossing Structure: Fenton Road Highway 134, Chenango Bridge, N. Y. (75).

Denver and Rio Grande Western

Grade Crossing Elimination: Overcrossings: Buena Vista, Colo., \$60,000 (100). Hill Top, Colo., \$18,000 (10). Subways: Deer Creek, Colo., \$23,000 (20).

Denver & Salt Lake

Grade Crossing Elimination: Overcrossings: Tabernash, Colo., \$75,000 (5). Subways: Coal Creek, Colo., \$69,000 (15).
Important Work Undertaken: Continuously welding rail in Moffat Tunnel 6.45 miles, \$107,000 (100).

DeQueen and Eastern

Grade Crossing Elimination: Overcrossings: Lockesburg, Ark., \$28,109.60 (100).

Detroit & Toledo Shore Line

Grade Crossing Elimination: Overcrossings: West Road, Trenton, Mich., \$762,000 (95). Subways: Outer Drive, Detroit, Mich., \$473,684 (01).

Detroit, Toledo & Ironton

Grade Crossing Elimination: Overcrossings: Trenton, Mich., joint with the N. Y. C. and D. & T. S. L., \$762,000 (95).

Duluth, Missabe and Iron Range

Grade Crossing Elimination: Subways: Relocation of Highway No. 53, Davis, Minn., \$95,000 (60).
Important Work Undertaken: Relocation of yard tracks, Hull Rust Yard, Hull Rust, Minn., \$220,000 (95).

Duluth, South Shore & Atlantic

Grade Crossing Elimination: Subways: State Trunk Highway M-94, Marquette, Mich., \$100,000 (100).

Elgin, Joliet & Eastern

Important Work Undertaken: Replacing boilers with stoker-equipped boilers, Gary, Ind., \$175,000 (100).

Erie

Grade Crossing Elimination: Overcrossings: Tift street viaduct, joint with Lehigh Valley, Erie, Penna., New York, Chicago & St. Louis, Baltimore & Ohio, and South Buffalo, Buffalo, N. Y. (100). Kennedy, N. Y. (100). Pedestrian bridge at Phelps street, Youngstown, Ohio (100). Elimination of crossings at South Main street, E. Crossier street and Miller avenue, Akron, Ohio (100). Osborn, Ohio (15).
Subways: McLean boulevard, Paterson, N. J. (100). Crescent avenue; two crossings closed and replaced by pedestrian subway, Allendale, N. J. (5).
Reconstruction of Existing Grade Separation Structures: Kearny avenue over Greenwood Lake, Kearny, N. J. (15). Reconstructing and widening New York State Highway No. 1030, Avon, N. Y. (35). Reconstruction of overcrossing for State Road No. 13, Bolivar, Ind. (100).

Florida East Coast

Grade Crossing Elimination: Overcrossings: Southern boulevard, West Palm Beach, Fla., \$210,000 (1).
Important Work Undertaken: New approaches to draw span, St. Lucie river, Stuart, Fla., \$178,000 (100).

Fort Smith, Subiaco & Rock Island

Grade Crossing Elimination: Highway No. 22, Dardanelle, Ark., three crossings closed.

Georgia & Florida

Grade Crossing Elimination: Overcrossings: Steel and concrete crossing, mile post 240, DeBruce, Ga., \$57,400 (100). Steel and concrete crossing, mile post 194, Midville, Ga., \$27,360 (100).
Reconstruction of overhead crossing, DeVore's store, S. C., \$20,000 (100).

Georgia

Grade Crossing Elimination: Subway: Union Point, Ga., \$32,853 (100).

Great Northern

Grade Crossing Elimination: Overcrossings: Creosoted timber on concrete piers, Maple, Minn., \$10,600 (none). Steel and concrete bridge, Willmar, Minn., \$105,000 (100). Steel and concrete highway, Clara City, Minn., \$54,700 (100). McGregor, N. D., \$3,900 (100). Steel and concrete bridge, Shelby, Mont., \$132,000 (100). Steel and concrete bridge, Ft. Browning, Mont., \$50,000 (none). Norton avenue, Everett, Wash., \$70,000 (100). River street, Tacoma, Wash., \$250,000 (100). Vancouver, B. C., \$320,000 (none).
Subways: 13th street, Fargo, N. D., \$200,000 (5). Steel and concrete including relocation of highway, Wolf Point, Mont., \$150,000 (none). Olney, Mont., \$46,700 (100). Stratford, Wash., \$136,500 (15). Clayton, Wash., \$40,350 (100). Brewster, Wash., \$145,000 (100). Index, Wash., \$48,200 (100).
Relocation of Highways: University avenue and 29th street, Min-

neapolis, Minn., \$141,000 (100). Replacing timber bridge, Union street, Fergus Falls, Minn., \$52,540 (90). Replacing timber bridge 10th street, Fargo, N. D., \$163,800 (100). Replacing timber approach to overhead bridge with steel beams, Minot, N. D., \$30,000 (100).

Important Work Undertaken: New power plant and installation of direct steaming in 20 stalls of engine house, Hillyard, Wash., \$199,850 (90).

Gulf Coast Lines

Important Work Undertaken: Extend Atchafalaya River bridge, Krotz Springs, La., \$723,000 (20).

Gulf, Mobile & Northern

Grade Crossing Elimination: Subway: Mobile, Ala., \$80,000 (100).

Houston Belt & Terminal Ry.

Grade Crossing Elimination: Subway: Neils Esperson Industrial district, Houston, Tex., \$20,000 (100).

Illinois Central

Grade Crossing Elimination: Overcrossings: Starnes, Ill., \$160,000 (90). Lincoln, Ill., \$160,000 (90). Mt. Pulaski, Ill., \$50,000 (60). Bethel, Ill., \$7,500 (100). Sheldon, Iowa, \$25,000 (100). Rockwell City, Iowa, \$50,000 (100). Riceville crossing, Fulton, Ky., \$65,000 (100). Mayfield, Ky., \$75,000 (100). South End yard, Fulton, Ky., \$55,000 (40). Graham, Ky., \$70,000 (40). Nortonville, Ky., \$65,000 (60). South Parkway, Memphis, Tenn., \$200,000 (100). Winona, Miss., \$35,000 (100). Jackson, Miss., over A. & V., \$75,000 (50). Jackson, Miss., over A. & V., \$50,000 (60). Jackson, Miss., over G&ST., \$60,000 (100). Subways: Tuscola, Ill., \$146,000 (65). Springfield, Ill., Linn street, \$100,000 (35). Eldens, Ill., \$75,000 (15). Seventh street, Louisville, Ky., \$100,000 (100). Bossier City, La., \$200,000 (75). Baton Rouge, La., \$50,000 (40).

Important Work Undertaken: Steel car repair shed, Centralia, Ill., \$254,000 (100).

Illinois Terminal

Grade Crossing Elimination: Overcrossings: Venice, Ill., (100). Springfield, Ill. (75). Lincoln, Ill. (75).

International-Great Northern

Grade Crossing Elimination: Overcrossings: Spring, Tex., \$101,000 (100).

Kansas City Southern

Grade Crossing Elimination: Overcrossings: U. S. Route No. 71, Wickes, Ark., \$32,482 (100). Subway: 5th street, U. S. No. 171, Leesville, La., \$175,000 (100).

Kentucky & Indiana Terminal

Grade Crossing Elimination: Subway: 18th and 21st streets, Louisville, Ky., \$390,000 (100). Reconstruction of Existing Grade Separation Structures: Market Street underpass, \$80,000 (75).

Lake Superior & Ishpeming

Grade Crossing Elimination: Overcrossings: Highway M-94, Carlshend, Mich., \$31,400 (100). Highway 41, Harvey, Mich., \$41,000 (100).

Lehigh and Hudson River

Grade Crossing Elimination: Overcrossings: Including relocation of highway, Maybrook, N. Y., joint with N. Y. N. H. & H., \$35,000 (100).

Lehigh Valley

Grade Crossing Elimination: Overcrossings: Athens-Towanda road, Athens, Pa. (100). Tift street, Buffalo, N. Y. (100). Town Line road, Homer, N. Y. (100). Honeyoe Falls-Pittsford highway, Mendon, N. Y. (100). Ithaca County highway 454, Ithaca, N. Y. (100). Cayuta Creek road, Barton, N. Y. (15).

Subways: Transit road, Depew, N. Y. (100). Van Uleet road, Lodi, N. Y., includes two crossings and marginal road (100).

Los Angeles Union Station

Important Work Undertaken: Completion of new Union Station, train shed, interlocking, baggage and express facilities, Los Angeles, Calif., \$10,857,397 (85).

Louisiana, Arkansas & Texas

Grade Crossing Elimination: Subways: Cumby, Tex., \$30,000 (85).

Louisville and Nashville

Grade Crossing Elimination: Overcrossings: Outer St. Clair avenue, E. St. Louis, Ill., \$260,000 (80). Red Star, Ky., \$25,000 (started). Brandenburg, Ky., \$50,000 (25). Chatsworth, Ga., \$55,000 (25). Fairmount, Ga., \$44,000 (started). Wyvern, Ga., \$53,000 (100). Memphis, Tenn., \$272,521 (100). Welwyn, Tenn., \$95,630 (100). Elmore, Ala., \$35,000 (50). Letohatchie, Ala., \$45,000 (100). Snow Hill, Ala., \$16,000 (100). Greenville, Ala., \$40,000 (started). Henderson Point, Miss., \$211,000 (25).

Subways: St. Clair avenue, E. St. Louis, Ill., \$229,500 (100). Lexington, Ky., \$50,000 (100). Madisonville, Ky., \$50,000 (100). S-14 Spring street, Louisville, Ky., \$171,760 (100). 7th and Magnolia avenue, Louisville, Ky., \$553,000 (started). Elizabethtown, Ky., \$60,000 (started). Gibsons Station, Va., \$55,665 (started). White, Ga., \$20,000 (started). Elizabeth, Ga., \$90,000 (75). Cumberland avenue, Knoxville, Tenn., \$42,957 (started). Oliver Springs, Tenn., \$29,271 (started). Springfield, Tenn., \$31,200 (started). Englewood, Tenn., \$40,000 (started). Attalla, Ala., \$64,120 (100). Birmingham, Ala., \$282,000 (75).

Important Work Undertaken: Erection of shed, boiler house, stack and coal pit and tracks at Cincinnati, Ohio, \$128,873 (100).

Maine Central

Grade Crossing Elimination: Overcrossings: Oakland, Me., \$68,458 (100). Yarmouth, Me., \$73,300 (100). Relocation of Highways: Baldwin, Me., \$48,600 (100). Cherryfield, Me., \$99,500 (15).

Manistee & Northeastern

Important Work Undertaken: Drawbridge and approach spans, Manistee, Mich., \$200,000 (30).

Minneapolis, St. Paul & Sault Ste. Marie

Grade Crossing Elimination: Overcrossings: Appleton, Wis., \$60,000 (60). Gould City, Mich., \$100,000 (40). Minot, N. D., \$166,000 (100). Fordville, N. D., \$30,000 (100).

Subways: Goodman, Wis., \$103,000 (80). McGrath, Minn., \$40,000 (100). St. Paul, Minn., \$30,000 (100). Mundelein, Ill., \$93,000 (100).

Missouri & Arkansas

Grade Crossing Elimination: Overcrossings: Alpena, Ark., \$30,000 (100).

Missouri-Kansas-Texas

Grade Crossing Elimination: Overcrossings: Cisco, Tex., \$135,800 (100).

Subways: Tulsa, Okla., \$77,072 (100). Oswego, Kan., \$81,607 (80). Relocation of Highway, Alvarado, Tex., to Grandview, \$160,000 (10).

Missouri Pacific

Grade Crossing Elimination: Overcrossings: U. S. route 65, Hollister, Mo., \$75,000 (100). Opt. U. S. route 50, joint with Chicago, Rock Island & Pacific, Greenwood, Mo., \$150,000 (1). Minnesota avenue, joint with Union Pacific, Kansas City, Mo., \$325,000 (1). Utah street, Atchison, Kan., including approach to bridge over river, \$112,000 (100). U. S. route 64, Gleason, Ark., \$125,000 (1). U. S. route 71, Texarkana, Ark., \$172,000 (1). Pollock, La., \$125,000 (100). Galion, La., \$114,390 (60). Jackson street, joint with Louisville & Nashville, Memphis, Tenn., \$354,280 (100).

Subways: U. S. route 50, Sedalia, Mo., \$50,000 (100). Chippewa street, U. S. route 66 (Gravois avenue), St. Louis, Mo., \$660,000 (1). Garnett, Kan., U. S. route 59, \$85,130 (80). Eads, Colo., \$90,000 (5). Willett street, joint with Nashville, Chattanooga & St. Louis, \$190,000 (2). Relocation of Highways: U. S. route 54, Yates Center, Kan., \$77,000 (100). U. S. route 65, Winchester to McGehee, Ark., \$200,000 (100). U. S. route 165, Standard to Urania, La., \$170,000 (0). U. S. route 165, Rochelle to Linco, La., \$160,000 (0).

Mobile & Ohio

Grade Crossing Elimination: Overcrossings: Shubuta, Miss., \$70,000 (100). Sucarnochee, Miss., \$50,000 (100). Corinth, Miss., \$75,000 (100). Jackson, Tenn., \$100,000 (100). Centerville, Ala., \$40,000 (100). Tuscaloosa, Ala., \$94,519 (100). McIntyre, Miss., \$40,000 (100). Millstadt Junction, Ill., \$102,000 (100).

Subways: Mayhew, Miss., \$70,000 (100). Ava, Ill., \$37,000 (100). Gordo, Ala., \$74,000 (100).

Nashville, Chattanooga & St. Louis

Grade Crossing Elimination: Overcrossings: Gordon street, Dalton, Ga., \$43,000 (100). Bridgeport, Ala., \$36,000 (100). 9th street, Chattanooga, Tenn., joint with Southern Ry., \$225,000 (100). Winchester, Tenn., \$80,000 (100).

Reconstruction of Existing Grade Separation Structures: Ryan, Ky., \$16,500 (100).

Relocation of Highways: Federal route 1, Cartersville, Ga., \$38,180 (100).

New York Central

Grade Crossing Elimination: Overcrossings: Viaduct over 11th avenue at W. 41st street, New York, including alteration to Stock Yard spur and Stock Yard buildings, \$764,200 (100). Viaduct, 11th avenue, New York, to eliminate grade crossings between W. 34th street and W. 37th street, \$1,031,500 (85). Reconstruction of 30th street yard, \$5,500,000 (4). Fort Lee road, Bogota, N. J., includes pedestrian subway, \$406,900 (10). Belle Isle, N. Y., \$257,800 (100). Palmer avenue, Bryn Mawr Park, N. Y., \$183,000 (100). Ontario street, Buffalo, N. Y., \$395,900 (100). North Main street, Jordan, N. Y., \$245,600 (100). Tift street, Lackawanna, N. Y., \$1,178,100 (100). South 2nd, South Ann, 5th and 6th streets, Little Falls, N. Y., \$506,300 (100). Montrose crossing, Montrose, N. Y., \$153,000 (99). Congress street, Schenectady, N. Y., \$211,200 (100). Verona crossing, Verona, N. Y., \$192,200 (100). East avenue, Erie, Pa., \$212,351 (100).

Subways: Blossom road, Brighton, N. Y., \$408,100 (100). Transit road, Depew, N. Y., \$764,600 (100). Yonkers avenue, Dunwoodie, N. Y., \$328,500 (100). Pleasantville road, Thornwood, N. Y., \$279,850 (50). Sheridan drive, Tonawanda, N. Y., \$231,100 (100). U. S. route 20 State highway 2, Geneva, Ohio, \$429,000 (100). State highway 460, Cleveland, Ohio, \$71,000 (100). State route 10, Cleveland, Ohio, \$831,700 (90). State highway 52, Millbury, Ohio, \$271,492 (100). Route 154, Seatonville, Ill., \$90,000 (15). U. S. route 30-N, Bucyrus, Ohio, \$87,000 (100). East George street, Cedar Grove, W. Va., \$40,256 (100).

Important Work Undertaken: Covering over tracks West 79th street to St. Clair place, except West 94th to West 98th street, structure No. 5, New York, \$13,000,000 (99). Express highway between St. Clair place and Dyckman street, structures No. 6, 7 and 8, New York, \$8,000,000 (99). Warehouse and factory, West 30th street, New York, \$360,000 (100). Boulevard Underpass, 135th street and Park avenue, New York, \$300,000 (50). Sub-station No. 13 at 126th street and Park avenue, New York, \$220,000 (1). Extension of passenger platforms between tracks 107, 108, 109 and 110, Grand Central Terminal, New York, \$108,000 (60). Filling in and retiring bridge No. 74, Newburgh, N. Y., \$190,000 (90). Reconstruction of bridge 723, Churchville, N. Y., \$198,000 (50). Reconstruction of bridge W-589, East Buffalo, N. Y., \$206,800 (100). Reconstruction of bridge 156, Larrys Creek, Pa., \$287,300 (100). Reconstruction of bridge 52-A, Mannsville, N. Y., \$136,000 (100). Altering

and protecting 31 bridges and culverts and placing riprap along roadway slopes and raising roadbed above new pool level in connection with United States dams in Great Kanawha river, Pt. Pleasant to Charleston, W. Va., \$455,000 (70). Replacing lower quadrant semaphore with color light signals, Vickers to Cleveland, Ohio, \$222,030 (85).

(Boston & Albany) Overcrossings: Main street, Huntington, Mass., \$342,500 (100). Medway street, Milford, Mass., \$124,500 (100). (Cleveland, Cincinnati, Chicago & St. Louis) Overcrossings: Fairfield, Ohio, \$153,750 (30). Elliston, Ind., \$300,000 (40).

Subways: Track elevation, Cincinnati, Ohio, \$975,000 (60). U. S. route 36, Chrisman, Ill., \$100,000 (90).

Relocation of Highways: Rockford, Ohio, \$80,000 (100). State Road 46, Longnecker, Ind., \$45,000 (100).

Reconstruction of Existing Grade Separation Structures: New subway to secure improved highway alignment and eliminate center supporting columns, West Washington street, Indianapolis, Ind., \$320,000 (20).

(Indiana Harbor Belt) Overcrossing: Roosevelt road, U. S. route 6, Broadview, Ill., \$300,000 (100).

Reconstruction of Existing Grade Separation Structures: Widening subway, Ashland avenue, State route 49, Chicago, Ill., \$200,000 (50).

(Michigan Central) Overcrossings: U. S. route 25, Vienna, Mich., \$137,000 (80). Trenton, Mich., \$725,000 (85).

Subways: Nonzano street, Ecorse, Mich., \$510,000 (5). (Pittsburgh & Lake Erie) Overcrossings: 21st street, Monaca, Pa., \$380,000 (100).

Relocation of Highways: Eliminating grade crossing by relocating 1,500 ft. of Bradys Run Branch, Fallston, Pa., \$37,500 (100).

Important Work Undertaken: Construction of power house, Pittsburgh, Pa., \$540,000 (100).

New York, Chicago & St. Louis

Grade Crossing Elimination: Overcrossings: Tift street, Buffalo, N. Y., \$33,000 (100). Vermilion, Ohio, \$298,000 (100). 103rd street viaduct, Chicago, Ill., joint with Chicago & Western Indiana, Belt Rv. of Chicago and New York, Chicago & St. Louis, \$670,000 (100). Subway, Main street, Bellevue, Ohio, \$210,510 (100).

New York, New Haven & Hartford

Grade Crossing Elimination: Overcrossings: West Mansfield, Mass., including pedestrian subway, \$100,000 (100). Canaan, Conn., \$100,000 (100). Newington, Conn., \$140,000 (100). Willimantic, Conn., \$250,000 (100). Maybrook, N. Y. (includes pedestrian subway), \$370,000 (100). Boro of Queens, N. Y., \$35,000 (25).

Subways: Cocasset street, Foxborough, Mass., \$100,000 (100). Union street, Braintree, Mass., \$170,000 (100). Windsor, Avon, Russell and Canton streets, Hartford, Conn., \$370,000 (100). Ten Rod road, Wickford Junction, R. I., \$250,000 (75).

Reconstruction of Existing Grade Separation Structures: Reconstruction, subway bridge, Main street, Sharon Heights, Mass., including pedestrian subway at Garden street, \$90,000 (100). Cranston, R. I., \$90,000 (25). Bullock's Point avenue, Riverside, R. I., \$45,000 (25). Lowe street, South Norwalk, Conn., \$35,000 (100).

Important Work Undertaken: Construction of freight house, including covered platform, new driveways and yardmaster's office, \$300,000 (100). Facilities for servicing air conditioned cars, Grand Central Station, N. Y., \$106,000 (100).

Norfolk & Western

Grade Crossing Elimination: Overcrossings: Eckman, Va., \$201,000 (100). Ironton, Ohio, \$270,000 (100). South Norfolk, Va., \$310,000 (100). Front Royal, Va., \$18,000 (100).

Subways: Buena Vista, Va., \$80,000 (100). Kenova, W. Va., \$187,000 (100). Pounding Mill, Va., \$62,000 (100). St. Paul, Va., \$94,000 (75).

Relocation of Highways: Cedar Bluff, Va., \$3,000 (100).

Norfolk Southern

Grade Crossing Elimination: Overcrossings: South Norfolk, Va., \$311,544 (100). Providence road, Va., \$74,798 (100). Grimesland, N. C., \$49,894 (30). Wilson, Va., \$53,000 (70).

Subways: Louisburg road, Raleigh, N. C., \$67,000 (100). Bonsal, N. C., \$67,000 (100).

Northern Pacific

Grade Crossing Elimination: Overcrossings: Fergus Falls, Minn., \$60,000 (100). 29th street and University avenue, Minneapolis, Minn., \$145,500 (100). Pullman, Wash., \$96,500 (100).

Subways: Fertile, Minn., \$64,000 (45). Fargo, N. D., \$307,500 (100). 13th street undercrossing, Fargo, N. D., \$337,300 (100). Barry street, Glendive, Mont., Laurel, Mont., \$85,000 (80). Harris street, Missoula, Mont., \$296,000 (75). Deep Creek, Wash., \$93,400 (100). Moab, Wash., \$60,000 (100). Bassett Junction, Wash., \$40,700 (100). Adrian, Wash., \$26,500 (100).

Important Work Undertaken: Warehouse for Pacific Fruit & Produce Co., Seattle, Wash., \$175,000 (100). Warehouse, clearing site and tracks for Montgomery Ward Co., Spokane, Wash., \$150,000 (100). Warehouse, clearing site and tracks for Sears-Roebuck Co., Spokane, Wash., \$160,000 (100). Warehouse for International Harvester Co., Spokane, Wash., \$213,000 (100).

Panama Railroad

Important Work Undertaken: Installation of stone ballast, Colon to Panama, \$192,000 (82).

Pere Marquette

Grade Crossing Elimination: Subways: Highway M-114, Grand Rapids, Mich., \$127,400 (15).

Pennsylvania

Grade Crossing Elimination: Overcrossings: Gordonville, Pa. (100). Odenton, Md. (60). Wilmington, Del. (100). Montour Falls, N. Y. (100). South Akron, Ohio (100). Ebenezer, N. Y. (100). Dunreith, Ind. (100). Grand Rapids, Mich. (100). Wayland, Mich. (5). Fosters, Ohio (100). Erie, Pa. (100).

Subways: Deans, N. J. (100). Track elevation, Woodbridge, N. J., to eliminate five crossings, includes new passenger and freight stations (10). Edgewood, Md. (100). Walbridge, Ohio (100). Bellevue, Ohio

(100). E. St. Louis, Ill. (100). Crown Point, Ind. (100). E. Mansfield street, Bucyrus, Ohio (100).

Relocation of Highway: Haysville, Pa. (100).

Reconstruction of Grade Crossing Structure: Blandenburg road, Washington, D. C. (100). Winans, Md. (100). The foregoing projects were constructed with the aid of federal funds at an approximate total cost of \$6,367,760.

(Long Island) Overcrossings: Eliot avenue, Fresh Pond, L. I. (100). Subways: Lynbrook, L. I. (90).

Important Work Undertaken: Rearrangement of tracks and installation of car retarders, Eastbound Classification yard, Enola, Pa. (100). Electrification of main tracks and portions of yards, Morrisville, Pa., Paoli, Pa., and Perryville, Md., to Enola, Pa. and Harrisburg, Pa.; Monmouth Junction to South Amboy, N. J.; Meadows yard, N. J.; Trenton, N. J.; Millham branch to Coalport; Philadelphia, Richmond street and 52nd street; Arsenal to Greenwich; Frankford Junction to Pavonia, N. J. (100). Philadelphia Terminal improvements, Philadelphia, Pa. (89). Additional 10-room banana ripening building at 21st street Produce Terminal, Pittsburgh, Pa. (100). Reconstruction of 560 lin. ft. reinforced concrete dock wall at Lakefront Ore Dock No. 11, Cleveland, Ohio (100). 3700 lin. ft. of dock and dock wall, 350-car yard and construction of 400 ft. channel 8000 ft. long, Sandusky, Ohio (80). Approximate cost of foregoing projects, \$107,845,000.

Pennsylvania-Reading Seashore Lines

Grade Crossing Elimination: Overcrossings: 12th street, Folsom, N. J. (100).

Reading

Grade Crossing Elimination: Overcrossings: Reading, Pa., \$68,300 (100).

Subways: Wilmington, Del., \$16,000 (100). Woodbridge, N. J., \$72,000 (100). Mt. Airy avenue, Philadelphia, Pa., \$282,000 (15). Track elevation to eliminate crossings at 22nd & Allegheny avenue, Philadelphia, Pa., \$932,900 (1).

Reconstruction of Existing Grade Separation Structures: Reconstruction of bridges No. 50/88 and 51/19 over Spring creek, east of Harrisburg, Pa., \$74,300 (100).

River Terminal Railway

Important Work Undertaken: Additional yard tracks and installation of track scale, Cleveland, Ohio \$152,000 (100).

St. Johnsbury & Lake Champlain

Relocation of Highways: Fletcher, Vt., \$23,000 (100).

St. Louis-San Francisco

Grade Crossing Elimination: Overcrossings: 23rd street, Kansas City, Mo., \$536,000 (100). U. S. route 75, Mounds, Okla., \$55,000 (100). County road, Palos, Ala., \$16,000 (100). U. S. route 169, Hillsdale, Kan., \$125,224 (100). U. S. route 78, Hickory Flat, Miss., \$16,600 (100). U. S. route 78, Potts Camp, Miss., \$31,600 (100). State highway 11, Frisco City, Ala., \$60,000 (75). Lafayette street, Fayetteville, Ark., \$30,000 (90). U. S. route 61, Yarbrow, Ark., \$130,000 (75). West Lancaster avenue, Fort Worth, Tex., \$557,467 (85).

Subways: Florida street, Memphis, Tenn., \$280,346 (100). State highway 30, Gravois, Mo., \$300,000 (100). May avenue, Oklahoma City, Okla., \$60,000 (100). U. S. route 75, Preston, Okla., \$40,000 (100). U. S. route 62, Prairie Grove, Ark., \$7,000 (100). Fifth avenue north, Birmingham, Ala., \$94,000 (90).

Reconstruction of Existing Grade Separation Structures: Replacement of old inadequate structure, Harrisonville, Mo., \$19,380 (100).

Relocation of Highways: U. S. route 78, Myrtle, Miss., New Albany, Wallerville, and Blue Springs, \$127,400 (100). U. S. route 63, Bay, Ark., to Truman. U. S. route 63, Gilmore, Ark., to Turrell, \$122,000 (100).

St. Louis Southwestern

Grade Crossing Elimination: Overcrossings: Benton, La., \$98,520 (100). Kingsland, Ark., \$110,000 (60).

Relocation of Highways: 1.9 miles of track, Tyler, Tex., \$65,000 (100).

Savannah & Atlanta

Grade Crossing Elimination: Overcrossings: Port Wentworth, Ga., crossing of main line Port Wentworth branch, and route No. 17, Chatham, Ga., \$48,000 (10).

Important Work Undertaken: Relocation, 2.25 miles main line, revision of grades on 3.75 miles, and elimination of timber trestle and culvert changes, Sylvania, Ga., to Bascom, \$130,000 (30).

Seaboard Air Line

Grade Crossing Elimination: Overcrossings: Franklin, Va. (100). Bowers Hill, Va. (90). Dixiana, S. C. (100). Coney, Ga. (100). Cuthbert, Ga. (100). Calvin, Ga. (100). Savannah-Central Junction, Ga. (90). Savannah-Ogeechee road, Ga. (100).

Subways: Vass, N. C. (100). Hamlet, N. C. (60). Charlotte-Tryon street, N. C. (40). Fifth avenue and 32nd street, Birmingham, Ala. (90).

Southern

Grade Crossing Elimination: Overcrossings: Midlothian, Va., \$43,000 (100). Main street, Appalachia, Va., \$7,250 (100). Gretna, Va., \$20,000 (100). Faber, Va., \$20,000 (10). Amelia, Va., \$44,000 (10). Hendersonville, N. C., \$55,000 (100). Mocksville, N. C., \$60,000 (25). Concord, N. C., \$40,000 (90). King's Mountain, N. C., \$95,000 (20). Gaffney, S. C., \$49,000 (100). Easley, S. C., \$102,000 (90). Dalton, Ga., \$21,700 (100). Toccoa, Ga., \$57,000 (60). Whitney, Ala., \$45,000 (100). 17th street, Knoxville, Tenn., \$104,000 (100). Jonesboro, Tenn., \$105,000 (100). Milltown, Ind., \$125,000 (100).

Subways: Appalachia, Va., \$55,000 (100). Glen Raven, N. C., \$116,000 (60). Brantley avenue, Kannapolis, N. C., \$164,800 (80). Kannapolis, N. C., \$102,000 (40). Rock Hill, S. C., \$12,000 (100). Grand avenue and 55th street, Birmingham, Ala., \$100,000 (5). Dutch Valley road, Coster, Tenn., \$65,000 (35).

Relocation of Highways: Locust Grove-McDonough, Ga., \$73,000 (100). (St. Johns River Terminal) Subway: Jacksonville, Fla., \$81,000 (30).

(Alabama Great Southern) Subway: Grand avenue & 55th street, Birmingham, Ala., \$200,000 (20).
(New Orleans & Northeastern) Overcrossings: Slidell, La., \$135,000 (100).
(Cincinnati, New Orleans & Texas Pacific) Overcrossings: Ninth street, Chattanooga, Tenn., \$251,000 (100). Williamstown, Ky., \$145,000 (100).

Spokane, Portland & Seattle

First Track: Branch line extension at Sweet Home, Ore., 0.75 miles.
Important Work Undertaken: Replacing culverts, North Bonneville, Wash., to Wishram, \$148,000 (75). Placing riprap, North Bonneville, Wash., to Wishram, \$300,000 (50).

Southern Pacific

First Track: Revision of line Russ, Cal., to Lang, 3.52 miles. Alameda, Oakland, Berkeley, Cal., to connect with San Francisco-Oakland Bay bridge, 8.031 miles. New line under construction, Redding, Cal., to Delta, 30.09 miles.

Second Track: From San Francisco, Cal., Oakland, Berkeley to 7.697 miles of track on San Francisco-Oakland Bay bridge, 0.588 miles.

Grade Crossing Elimination: Overcrossings: Cuesta, Cal., near Santa Margarita, \$100,019 (100). Solamint, Cal., \$65,325 (5). Shoshone, Nev., \$100,000 (100). Bunker Hill, south of Marshfield, Ore., \$61,993 (100). Corona, N. M., \$68,807 (25). Oswego, Ore., \$3,000 (100). Daly street, Los Angeles, Cal., \$37,238 (25). Soledad Canyon road between Russ and Lang, Cal., \$14,500 (100).

Subways: Livingston, Cal., \$203,970 (100). Lankershim boulevard, Los Angeles, Cal., \$240,000 (80). U. S. Army Air Depot, Planehaven, Cal., \$95,000 (20). Redding, Cal., \$208,897 (75). Rosemead boulevard, Rudell station, Los Angeles, Cal., \$144,157 (100). Whiteson, Ore., \$21,618 (100).

Relocation of Highways: Greenville, Cal., west of Altamont, \$62,002 (100). Redmond, Cal., east of Altamont, \$40,361 (100). Sand Canyon road between Lang and Humphries, Cal., \$10,000 (100).

Important Work Undertaken: Double track connection to Los Angeles Union station including bridge over Los Angeles river, signals and interlocking, \$1,155,696 (85). Revision of alignment and raising grade over Tehachapi mountain and through Soledad canyon, Cal., \$365,000 (90).

(San Diego & Arizona Eastern) Relocation of Highway, U. S. route 80, La Mesa, Cal., \$55,000 (20).

(Lines in Texas and Louisiana) *Grade Crossing Elimination:* Overcrossings: Jennings, La., \$120,000 (100). Nacogdoches, Tex., \$204,000 (started). Columbus, Tex., \$213,900 (4). Kelly Field, Tex., \$194,000 (started). Normana, near Texas highway, U. S. route 81, \$145,000 (started).

Subways: Jensen drive, Houston, Tex., \$145,000 (started). Elam, Tex., \$65,390 (35). Weimar, Tex., \$79,084 (15). McKinney, Tex., \$70,000 (started). Marlin, Tex., \$80,000 (2).

Relocation of Highways: Seco river to Sabinal, Tex., \$301,000 (started).

Tennessee Central

Grade Crossing Elimination: Overcrossings: Includes highway relocation, Cookeville, Tenn., \$46,000 (100).

Texas and Pacific

Grade Crossing Elimination: Overcrossing: Grand Saline, Texas, \$4,000 (100). Marshall, Texas, \$3,000 (100).

Subways: LaFourche street, Donaldsonville, La., \$65,000 (100). St. Patrick street, Donaldsonville, La., \$65,000 (25).

Toledo Terminal

Grade Crossing Elimination: Subways: Woodville road, Toledo, Ohio, \$215,000 (100).

Union Pacific

Lines Under Survey: Nevens, Neb., to Lewellen, 33.16 miles.

Grade Crossing Elimination: Overcrossings: State Road No. 1, Tum-

water, Wash., \$257,000 (100). Olive street, Salina, Kan., \$137,000 (20). County highway, New Plymouth, Ida., \$51,000 (100). State highway, Rose Lake, Ida., \$160,400 (15). Hood River, Ore., \$35,000 (100). U. S. route No. 81, Belvidere, Neb., \$45,000 (100). Gould street, Pocatello, Ida., \$170,000 (100). U. S. route No. 191, Thornton, Ida., \$100,000 (100). U. S. route No. 191, Warm River, Ida., \$100,000 (100). Union avenue, Portland, Ore., \$72,000 (100). N. E. 42nd avenue, Portland, Ore., \$42,000 (98). Meridian street, Puyallup, Wash., \$95,000 (81). U. S. route 195, Pullman, Wash., \$254,000 (86).

Subways: State highway No. 3, Colfax, Wash., \$55,000 (100). 46th avenue, Denver, Colo., \$316,000 (100). U. S. route No. 30, Ozone, Wyo., \$135,000 (100). U. S. route No. 30, Ontario, Ore., \$200,000 (100). State highway No. 6, Sutor, Nev., \$88,300 (100). Highway 168, Pico, Cal., \$220,000 (100).

Important Work Undertaken: Construction of railway mail terminal building, Council Bluffs, Iowa, \$225,000 (100). Install air-conditioning system in general headquarters building, Omaha, Neb., \$300,000 (100). Construction of two 200-ft. steel truss spans and two 30-ft. I-beam spans, Baxter, Cal., \$231,500 (90). Construction of steel truss spans and I-beam spans, Afton, Cal., \$207,500 (90). Construction of two steel truss spans and one span on reinforced concrete and steel pile abutment, Afton, Cal., \$260,000 (90). Construction of steel bridge, Yermo, Cal., \$185,300 (90). Renewing timber lining in tunnel, Olympia, Wash., \$131,500 (100).

The Virginian

First Track: Simon, W. Va. to Kopperston, 19.33 miles.

New Road Under Construction: Cub City, W. Va. on Cub creek, 7.8 miles.

Grade Crossing Elimination: Overcrossings: State Route No. 299, Bowers Hill, Va., \$109,140 (100).

Wabash

Grade Crossing Elimination: Overcrossings: Springfield, Ill., \$145,000 (75). Moberly, Mo., \$50,000 (100).

Subways: Toledo, Ohio, \$377,300 (100). Moberly, Mo., \$100,000 (100). Albia, Iowa, \$40,000 (100).

Western Maryland

Grade Crossing Elimination: Overcrossings: Randolph avenue, Elkins, W. Va., \$199,000 (100). Glen Morris, Md., \$220,000 (75). Hancock, Md., \$60,000 (50).

Western Pacific

Grade Crossing Elimination: Overcrossings: Greenville, Cal., \$120,000 (100). Oroville, Cal., \$30,000 (75).

Important Work Undertaken: Extension of passing sidings at Merlin, Cal. Rich and Sloat in Feather River canyon, \$83,000 (100). Installing additional ballast, Oroville, Cal. to Portola, \$126,000 (100). Installing additional ballast Scotts, Cal. to Doyle and Jungo, Nev. to Gasco, 23 miles, \$127,000 (100). Installing additional ballast Weso, Nev. to Alazon, 45 miles, \$260,000 (100). Construction of living quarters for section laborers at 16 points between Keddie, Cal., and Bieber, \$130,000 (100). New boiler house extension to locomotive erecting shops and installation of additional shop machinery and tools, including two traveling cranes, Sacramento, Cal., \$460,000 (100). Improvement in drainage and installation of additional culverts and one 5-span bridge in cloud-burst territory, Pilot, Utah to Wendover, and replacement of bridges, trestles and culverts with permanent structures at various locations, Oakland, Cal. to Salt Lake City, Utah, \$196,000 (100).

Wheeling and Lake Erie

Important Work Undertaken: Relocation of lines in connection with Muskingum conservancy district reservoir work, Bolivar, Ohio to Sherodsville, 14.61 miles; at Beach City, Ohio, 1.19 miles; Beach City, Ohio to Barrs Mills, 8.14 miles (100).

Railway Construction in Canada

Canadian National

First Track: Connection to Vancouver yard, Vancouver, B. C., 0.50 miles. Senneterre, Que., to Rouyn, 100.61 miles.

Grade Crossing Elimination: Overcrossings: Central avenue, Prince Albert, Sask.

Subways: Mann avenue, Ottawa, Ont. Notre Dame street, Montreal, Que., St. Marguerite street, Montreal, Que., 18th street, New Toronto, Ont., Victoria Park avenue, Danforth, Ont. (Toronto).

Reconstruction of Existing Grade Separation Structures: D'Argenson street, Montreal, Que.

Important Work Undertaken: Reconstruction of St. John River bridge and construction of engine facilities, subways, etc., Fredericton, N. B. Improving Victoria bridge highway floor, Montreal, Que. Ramp approach to First avenue bridge over railway tracks and Glen Drive, Vancouver, B. C. Reconstruction of bridge over Sundance Creek, Brule, Alta. New station, Saskatoon, Sask. Reconstruction of bridge over Kyax River, Skeena subdivision, B. C.

Canadian Pacific

Grade Crossing Elimination: Subways: Ste. Therese, Que., \$53,600 (100). Elders Mills, Ont., \$34,000 (100). James street, Winnipeg, Man., \$99,800 (100). Neptune, S. D., \$3,000 (100).

Relocation of Highway: Berthier-Pointe du Lac, Que. (to be completed in 1939). Morse and Herbert, Sask., \$38,000 (100).

Important Work Undertaken: Renovating and remodeling work to provide modern bedrooms with bathrooms, and some new sample rooms, Royal Alexandra hotel, Winnipeg, Man., \$140,000 (100). Line diversion, Downie, B. C., \$300,000 (100).

Quebec Central

Grade Crossing Elimination: Overcrossings: Highway bridge approximately one mile south of Lennoxville, P. Q., on Highway No. 5, including bridge over Massawippi river, \$96,000 (90).

Revision of alignment to permit construction of subway, Quebec subdivision, Ascot, P. Q., \$21,652 (100). Diversion of alignment to accommodate Highway No. 1, Ascot, P. Q., \$37,025 (100).

Railway Construction in Mexico

National of Mexico

Important Work Undertaken: New station and station grounds, San Luis Potosi, S.L.P., \$207,000 (25) (Work suspended). New engine-house and extension of 30 stalls, San Luis Potosi, S.L.P., \$180,000 (15). Reconstruction of bridge over Morallillo River, Km. L-666, Tampico, \$160,000 (100). Construction of nine truss spans over Rio San Pedro, Km. A-1521, \$180,000 (100). Extension of shop and installation of modern machinery, Aguascalientes, \$425,000 (100).

New Line Construction in Mexico

Ixcaxtla to Chacahua, \$6,337,197, 119 km. (Completed). Puerto, Mexico to Campeche, 780 km., survey completed, grading completed for 320 km., 174 km. of track laid, \$32,502,141. Caltzonzin-Apatzingan-Zihuatanejo, \$18,339,077, grading completed, five bridges completed, track laid, 79 km. Fuentes Brotantes-Punta Penasco, 172 km., survey completed, grading completed, 104 km., \$5,962,998.

Locomotives Ordered in 1938

Total of 228 is 62 per cent of 1937's volume; 36 steam, 163 Diesel and 29 electric; export and Canada down

By William H. Schmidt
Associate Editor

THE total of 228 locomotives ordered in the United States for domestic service during 1938 is but 62 per cent of the number of motive power units ordered in 1937 and 43 per cent of those in 1936. It should be noted, however, that it constitutes less of an absolute decline from the 1937 total than the latter does from the 1936 total, which gives basis for the belief that while the slackening of the motive power market which became apparent in the middle of 1937 has continued through 1938, the rate of the decline in volume is easing up to some degree. Again, 1938's volume is found to be substantially in excess of each of the years 1931 to 1935, inclusive, in spite of the fact that railroad earnings during 1938 were far less satisfactory on the whole than during these so-called depression years.

The 1938 total is made up of 36 steam locomotives, 29 electric locomotives and 163 locomotives of Diesel-electric, gasoline-mechanical and other types. The 1937

During the year foreign buyers placed orders in the United States for a total of 24 locomotives—13 steam, 6 electric and 5 Diesel-electric. While this total is substantially less than the 56 units so ordered during 1937, it does exceed the volume of each of the years 1932 to 1936, inclusive.

Canadian locomotive builders received orders during

Table II—Orders for Locomotives Since 1901

DOMESTIC ORDERS ONLY				
Year	Loco-motives	Year	Loco-motives	
1901.....	4,340	1908.....	1,182	
1902.....	4,665	1909.....	3,350	
1903.....	3,283	1910.....	3,787	
1904.....	2,538	1911.....	2,850	
1905.....	6,265	1912.....	4,515	
1906.....	5,642	1913.....	3,467	
1907.....	3,482	1914.....	1,265	
DOMESTIC AND FOREIGN				
Year	Domestic	Canadian	U. S. Export	Total
1915.....	1,612	...	850	2,462
1916.....	2,910	...	2,983	5,893
1917.....	2,704	...	3,438	6,142
1918.....	2,593	209	2,086	4,888
1919.....	214	58	898	1,170
1920.....	1,998	189	718	2,905
1921.....	239	35	546	820
1922.....	2,600	68	131	2,799
1923.....	1,944	82	116	2,142
1924.....	1,413	71	142	1,626
1925.....	1,055	10	209	1,274
1926.....	1,301	61	180	1,542
1927.....	734	58	54	846
1928.....	603	98	27	728
1929.....	1,212	77	106	1,395
1930.....	440	95	20	555
1931.....	176	2	28	206
1932.....	12	1 (Export)	1	14
1933.....	42	...	7	49
1934.....	183	...	17	200
1935.....	87*	27	15	129*
1936.....	533	1	22	556
1937.....	368	57 (Inc. Exp.)	56	481
1938.....	228	35	24	287

Table I—Locomotive Orders in 1938

For service in the United States	228
For export to other countries	24
For service in Canada and exports from Canada	35
Grand total	287

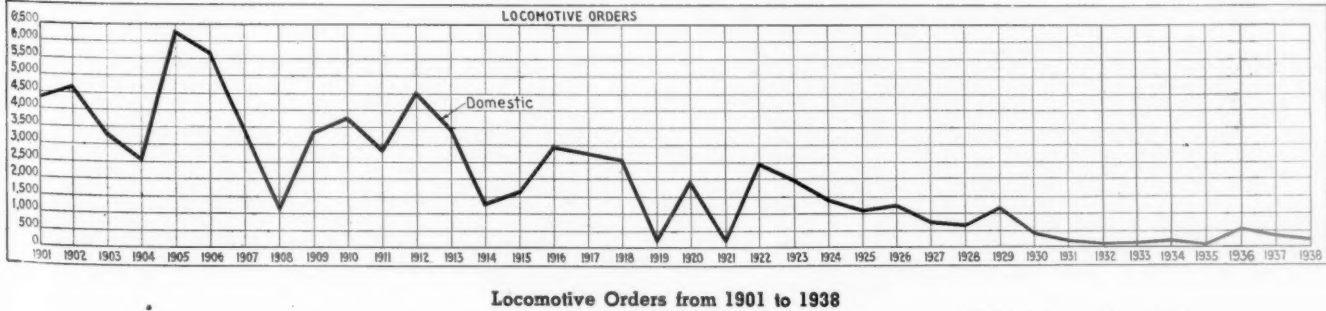
locomotive list comprised 176 steam, 36 electric and 156 Diesel and gasoline powered units. As has been the policy in these columns since 1936, units for streamlined trains which are power units exclusively and classed as non-revenue are listed and included in the locomotive totals. Power cars are tabulated as rail-motor cars, appearing under passenger cars.

The New York Central purchased the largest number of locomotives during the year, namely, 29 Diesel-electric switchers. The Chicago, Rock Island & Pacific is "runner-up" with a total of 27 locomotives, all Diesel-electric switchers, while the Pennsylvania is third with orders for 1 experimental steam locomotive and 24 electric units, or 25 locomotives in all. The largest steam motive power order was placed by the Norfolk & Western, which purchased 10 locomotives.

Prior to 1918, Canadian orders included under "Domestic."
* Revised to include locomotives for articulated or partially articulated trains.

the year for 35 locomotives, all steam, which is a total substantially higher than for any of the years 1931 to 1936, inclusive, but less than the Canadian volume for 1937.

Locomotives built during 1938 for domestic service in



Locomotive Orders from 1901 to 1938

the United States as distinguished from those ordered, totaled 272, of which 132 were steam, 37 electric and 103 Diesel-electric and others. This number is about 52 per cent of the 1937 total of 526, but is substantially

adian builders produced a total of 46 locomotives—all steam—which is 1 unit in excess of the 1937 total and just double the 1936 volume.

The distinction between locomotives ordered and the number built is important to an understanding of these statistics. A locomotive is under construction for several months and thus locomotive production figures for any year naturally include some units which were ordered during the closing months of the year previous to that under review. It is this overlap from year to year that results in a total production figure different from the total ordered. Also, while the factor has been unimportant in recent years, it should nevertheless again be pointed out, to those comparing the more recent with the more remote years listed in the accompanying tabulation, that modern locomotives are far more powerful and far more costly than those of the days when yearly orders totaled thousands.

The Car Service Division of the Association of American Railroads reports monthly totals of locomotive installations and retirements. These figures do not agree with the *Railway Age* totals of locomotives ordered or built, because the Car Service Division total covers only Class I carriers, whereas the *Railway Age* figures cover all carriers, and also industrial users.

The details in the appended list of locomotive orders were supplied by railways and other purchasers in response to inquiries from the *Railway Age*. They were checked against similar lists furnished through the co-operation of the builders, and amplified by reference to the weekly reports in the Equipment and Supplies column of the *Railway Age*. The *Railway Age* does not desire to make any claims as to the scientifically statistical accuracy of the tables, or totals drawn from them. However, the real purpose of the statistics is to allow comparisons of the year's business with that of other years, which purpose it is believed they serve with entire adequacy.

Table III—Locomotives Built in 1938

	United States			Canada	Total
Domestic	272			46	318
Foreign	28			0	28
Total	300			46	346

Comparison with Previous Years					
Year	Domestic	Foreign	Total	Year	Domestic Foreign Total
1896.....	866	309	1,175	1913†.....	4,561 771 5,332
1897.....	865	386	1,251	1914†.....	1,962 273 2,235
1898.....	1,321	554	1,875	1915†.....	1,250 835 2,085
1899.....	1,961	514	2,475	1916†.....	2,708 1,367 4,075
1900.....	2,648	505	3,153	1917†.....	2,585 2,861 5,446
1901.....	.....	.....	3,384	1918†.....	3,668 2,807 6,475
1902.....	.....	.....	4,070	1919†.....	2,162 1,110 3,272
1903.....	.....	.....	5,152	1920†.....	2,022 1,650 3,672
1904.....	.....	.....	3,441	1921†.....	1,185 638 1,823
1905*.....	4,896	595	5,491	1922†.....	1,303 231 1,534
1906*.....	6,232	720	6,952	1923†.....	3,505 280 3,785
1907*.....	6,564	798	7,362	1924†.....	1,810 226 2,036
1908*.....	1,886	456	2,342	1925†.....	994 291 1,285
1909*.....	2,596	291	2,887	1926†.....	1,585 185 1,770
1910*.....	4,441	314	4,755	1927†.....	1,009 167 1,176
1911*.....	3,143	387	3,530	1928†.....	636 111 747
1912†.....	4,403	512	4,915		

* Includes Canadian output.

† Includes Canadian output and equipment built in railroad shops.

	United States			Canada			Grand total
	Domestic	Foreign	Total	Domestic	Foreign	Total	
1929.....	926	139	1,065	96	..	96	1,161
1930.....	972	51	1,023	111	..	111	1,134
1931.....	181	17	198	24	..	24	222
1932.....	102	18	120	2	1	3	123
1933.....	57	6	63	..	..	..	63
1934.....	91	19	110	..	..	..	110
1935.....	184	17	201	4	..	4	205
1936.....	157	22	179	23	..	23	202
1937.....	526	44	570	43	2	45	615
1938.....	272	28	300	46	..	46	346

in excess of 1936's 157 locomotives. Locomotives built for export totaled 28—20 steam, 7 electric and 1 Diesel-electric, as compared with a total of 44 for 1937. Can-

Steam Locomotive Orders in 1938

For Service in the United States

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of order	Date of delivery	Builder
Chesapeake & Ohio.....	14*	Tenders	.....	.....	.....	.....	.....	1938	Company Shops
Chicago, Milwaukee, St. Paul & Pacific.....	6	4-6-4	Pass.	415,000	50,300	23½ x 30	April	Aug.-Sept.	American
Grand Trunk Western.....	6	4-8-4	Pass.	382,700	52,457	24 x 30	January	July-Aug.	Lima
Great Western Sugar Co.....	2	0-4-0	Sw.	43,000	9,650	11 x 16	June	July	Davenport-Besler
Norfolk & Western.....	10	2-8-2	Freight	.....	.....	.....	December	.....	Company Shops
Norfolk Southern.....	5	2-8-4	Freight	330,000	71,500†	23½ x 30	February	.....	Baldwin
Pennsylvania.....	1	6-4-4-6	Pass.	(Experimental)	.....	.....	March	December	Company Shops
Wheeling & Lake Erie.....	25*	Tenders	.....	.....	.....	.....	October	1939	Company Shops
White Pass & Yukon Route.....	1	2-8-4	Freight	407,500	64,135	25 x 34	September	December	American
		2-8-2	Freight	145,000	25,200	17 x 22	November	.....	Baldwin

Export

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of order	Date of delivery	Builder
Chilean State Railways.....	7	4-8-2	Fr. & Sw.	229,000	37,500	14½ x 28	March	July	Baldwin
Ferroc. Del N. Sec. Seg. (Colombia).....	2	4-8-2	Pass.	180,000	30,500	19 x 22	February	June	Baldwin
E. de F. Sorocabana (Brazil).....	4	4-10-2	.....	237,000	44,600	17½ x 22 & 24 (3 cyl.)	November	.....	American

Canada

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of order	Date of delivery	Builder
Canadian Pacific.....	15	4-6-2	Pass. & Fr.	321,000	45,250	22 x 30	March	December	Canadian
	5	4-6-4	Pass.	364,000	57,250†	22 x 30	March	August	Montreal
	5	4-6-4	Pass.	354,000	45,250	22 x 30	March	August	Montreal
	10	2-10-4	Pass.	447,000	89,200†	25 x 32	April	December	Montreal

* Not included in totals.

† Tractive force including booster.

Electric Locomotives

For Service in the United States

Purchaser	No.	Wheel arrangement	Service	Weight	Horse-power	Date of order	Date of delivery	Builder
Koppers Coal Co.....	2	B	Sw.	42,235	300	July	September	West.-Baldwin

Purchaser	No.	Wheel arrange- ment	Service	Weight	Horse- power	Date of order	Date of delivery	Builder Electrical Equip- ment—Locomotive
Pennsylvania.....	10	2-C+C-2	Pass.	460,000	4,620	June	April, '39	G. E.-Co. Sh.
	10	2-C+C-2	Pass.	460,000	4,620	June	April, '39	West.-Co. Sh.
Tennessee Coal, Iron & R. R.....	2	B	Sw.	80,000	190	June	Feb., '39	Atlas Car & Mfg. Co.
Woodward Iron Company.....	1	B	Sw.	44,475	300	February	August	West.-Baldwin
	1	B	Sw.	34,375	260	April	June	West.-Baldwin

Export

Purchaser	No.	Wheel arrangement	Service	Weight	Horse- power	Date of order	Date of delivery	Builder Electrical Equip- ment—Locomotive
International Nickel Co.....	2	B+B	Freight	200,000	.....	January	May	General Electric
Paulista Ry. (Brazil).....	4	2-C+C-2	Pass.	370,000	4,100	October	.....	General Electric

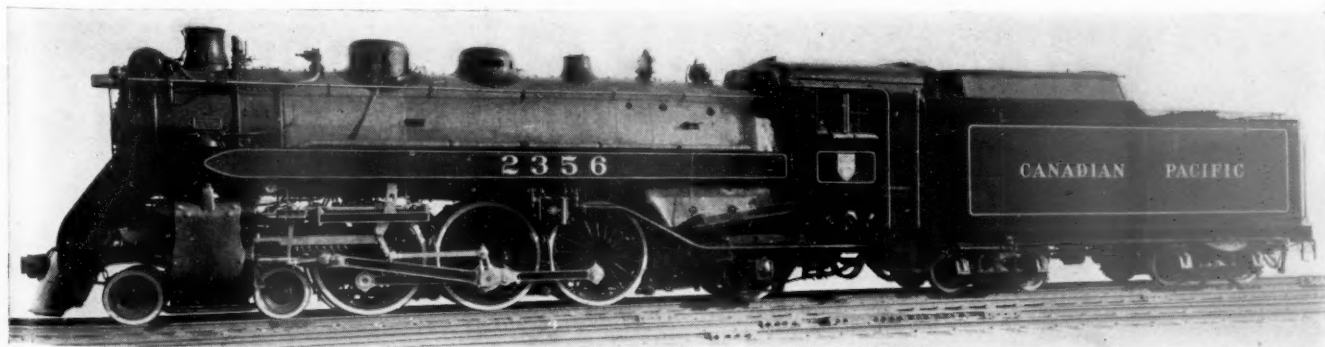
Diesel-Electric, Gas-Electric and Other Internal-Combustion Locomotives For Service in the United States

Purchaser	No.	Wheel arrange- ment	Service	Type	Weight	Horse- power	Date of order	Date of delivery	Builder Electrical Equip- ment—Locomotive Builder
American Rolling Mill Co.....	1	B	Sw.	Gas.	20,000	100	July	September	Midwest-Hercules
Ash Grove Lime & Port. Cement Co.	2	B	Sw.	Diesel-Elec.	46,000	150	October	December	G. E.-Cummins
Boston & Maine.....	1	B-B	Sw.	Diesel-Elec.	200,000	600	February	August	G. E.-American
	3	B-B	Sw.	Diesel-Elec.	200,000	600	June	July	Electro-Motive
	1	B	Sw.	Gasoline	60,000	250	April	May	Plymouth
Caterpillar Tractor Co.....	1	B-B	Sw.	Diesel-Elec.	210,000	720	April	February	G. E.-D. B.-Cater.
Central of New Jersey.....	6	B-B	Sw.	Diesel-Elec.	.....	600	December	.....	Electro-Motive
	4	B-B	Sw.	Diesel-Elec.	.....	600	December	.....	West.-American
Chicago & Eastern Illinois.....	1	B-B	Sw.	Diesel-Elec.	200,000	600	Dec. '37	January	G. E.-American
	2	B-B	Sw.	Diesel-Elec.	200,000	600	Dec. '37	January	Electro-Motive
Chicago, Rock Island & Pacific....	10	B-B	Sw.	Diesel-Elec.	200,000	600	July	July	Electro-Motive
	6	B-B	Sw.	Diesel-Elec.	250,000	900	July	August	Electro-Motive
	8	B-B	Sw.	Diesel-Elec.	200,000	600	February	March	Electro-Motive
	2	B-B	Sw.	Diesel-Elec.	250,000	900	February	March	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	88,000	250	August	November	West.-D. B.-Cater.
City of Seattle.....	1	B-B	Sw.	Diesel-Elec.	70,000	320	November	Jan., '39	West.-G. M.
General Electric Co.....	1	B-B	Sw.	Diesel-Elec.	100,000	120	Sept., '37	February	G. E.-Buda
Grand Trunk Western.....	2	B-B	Sw.	Diesel-Elec.	198,000	600	April	April	G. E.-Electro-Motive
Great Northern.....	10	B-B	Sw.	Diesel-Elec.	250,000	1,000	November	1939	Electro-Motive
	2	B-B	Sw.	Diesel-Elec.	200,000	600	November	1939	Electro-Motive
Green Bay & Western.....	1	B-B	Sw.	Diesel-Elec.	197,250	600	July	October	G. E.-American
Inland Steel Company.....	1	B	Sw.	Diesel-Mech.	90,000	340	July	August	Plymouth-Cooper Bess.
Kansas City Terminal.....	1	B-B	Sw.	Diesel-Elec.	230,000	900	November	December	G. E.-American
	2	B-B	Sw.	Diesel-Elec.	250,000	900	November	December	West.-Electro-Motive
Lehigh Portland Cement Co.....	5	B	Sw.	Diesel-Elec.	40,000	150	May	September	G. E.-Cummins
Lehigh Valley.....	4	B-B	Sw.	Diesel-Elec.	254,700	900	April	May	G. E.-Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	254,700	900	June	July	G. E.-Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	204,000	600	June	July	G. E.-Electro-Motive
	2	B-B	Sw.	Diesel-Elec.	254,700	900	August	September	G. E.-Electro-Motive
	2	B-B	Sw.	Diesel-Elec.	204,000	600	October	November	G. E.-Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	204,000	600	December	December	G. E.-Electro-Motive
Maine Central.....	1	B	Sw.	Gas.-Mech.	60,000	250	January	March	Plymouth-LeRoi
Manitou & Pikes Peak.....	1	B	Sw.	Diesel-Elec.	40,000	400	November	.....	G. E.-G. M.
Minneapolis & St. Louis.....	1	B-B	Sw.	Diesel-Elec.	197,060	600	February	March	G. E.-Elec. Motive
	1	B-B	Sw.	Diesel-Elec.	242,300	900	May	June	G. E.-Elec. Motive
	1	B-B	Sw.	Diesel-Elec.	242,300	900	May	August	G. E.-Elec. Motive
	1	B-B	Sw.	Diesel-Elec.	197,060	600	September	September	G. E.-Elec. Motive
Missouri Portland Cement Co.....	1	C	Sw.	Gas.-Mech.	60,000	170	March	April	D. B.-LeRoi
Muncie & Western.....	1	B-B	Sw.	Diesel-Elec.	100,000	340	February	May	West.-D. B.-LeRoi
New York Central.....	6	B-B	Sw.	Diesel-Elec.	200,000	600	October	Jan., '39	Electro-Motive
	14	B-B	Sw.	Diesel-Elec.	220,000	600	October	Apr., '39	Electro-Motive
	9	B-B	Sw.	Diesel-Elec.	220,000	600	October	Feb., '39	G. E.-American
New York, New Haven & Hartford	10	B-B	Sw.	Diesel-Elec.	190,200	600	January	Mar.-June	G. E.-American
Portland Terminal.....	1	B-B	Sw.	Diesel-Elec.	190,500	600	February	June	G. E.-American
Pressed Steel Car Co.....	1	B	Sw.	Diesel	24,000	125	Nov., '37	February	Midwest-Cummins
Reading Company.....	3	B-B	Sw.	Diesel-Elec.	.....	600	December	.....	Electro-Motive
	1	B-B	Sw.	Diesel-Elec.	.....	600	December	.....	West.-Baldwin
	1	B-B	Sw.	Diesel-Elec.	.....	600	December	.....	G. E.-Fairbanks, M.
Seaboard Air Line.....	7	C-C	Pass.	Diesel-Elec.	308,495	2,000	May-Oct.	Nov.-Jan., '39	Electro-Motive
	3	C-C	Pass.	Diesel-Elec.	298,960	2,000	May	Nov.-Dec.	Electro-Motive
Seatrains Lines, Inc.....	1	.....	.....	Diesel-Elec.	.....	600	July	.....	G. E.-American
Southwest Missouri.....	1	.....	.....	Gas.-Mech.	60,000	.....	April	.....	Plymouth
Texas-Mexican.....	7	D	Freight	Diesel-Elec.	142,000	660	April	.....	Whitcomb
Union Pacific.....	1†	.....	Pass.	Diesel-Elec.	.....	4,000	December	.....	Electro-Motive
Warrior River Terminal Co.....	1	B-B	Sw.	Diesel-Elec.	230,000	900	March	August	West.-American
	1	.....	.....	Diesel-Elec.	.....	900	October	.....	West.-American

†Each of two units.

Export

Purchaser	No.	Wheel arrange- ment	Service	Type	Weight	Horse- power	Date of order	Date of delivery	Builder Electrical Equip- ment—Locomotive Builder
Chiriqui Land Co. (Panama).....	1	.....	.....	Diesel-Elec.	.....	300	July	.....	G. E.-American
Surrinaamsche B.M., (Dutch Guiana)	4	.....	Sw.	Diesel-Elec.	36,000	114	February	April	West.-Whit.-Cummins



Pacific Type Passenger Locomotive Built for the Canadian Pacific By the Canadian Locomotive Company, Ltd.

Freight Cars Ordered in 1938

Domestic orders for 16,539 units is a substantial decline; number of purchasers small; Canada holds up well

By Frank W. Kraeger

Associate Editor

A TOTAL of 16,539 freight cars was ordered in the United States for domestic service during 1938. This volume is about 31 per cent of the 52,738 cars ordered in 1937 and 24 per cent of the 67,544 ordered in 1936. It is smaller than the freight car totals for any year since 1900, except 1931, 1932 and 1933.

The market in the freight car field this year was marked especially by a severe decline in the number of companies making purchases, only 56 concerns being reported as having placed orders, of which 22 are operating railroads. Orders placed by the Southern for a total of 8,188 freight cars contributed much to 1938's total, being almost as great as the number of cars purchased by all the other roads, transportation companies and industries lumped together. Other large purchasers were the Norfolk & Western, and the Illinois Central,

from previous years. They received orders during 1938 for a total of 4,902 cars, of which 5 were for export. This total compares with a total of 7,397 cars ordered in 1937 and but 271 in 1936, and, with the exception of 1937, is the highest volume of any year since 1929.

Table I—Freight Car Orders in 1938

For service in the United States	16,539
For service in Canada	4,897
For export to other countries (incl. Canadian-built)	442
Grand total	21,883

which placed orders for 2,135 and 2,100 cars, respectively.

Of the total volume of cars ordered, 2,029, or 12 per cent, were requisitioned from railroad company shops. Thus outside builders received a greater proportion of the total orders this year than in either 1937 or 1936, when company shops received 28 and 20 per cent of the total number of cars, respectively.

The total of 442 cars sold in foreign trade by American builders during 1938 constitutes a severe decline in volume from the 1,369 so ordered in 1937, but does compare favorably with the 526 ordered in 1936, which was deemed a comparatively "good" year in the domestic freight car field.

Canadian builders, relatively speaking, enjoyed a fair business in 1938, and their records show far less decline

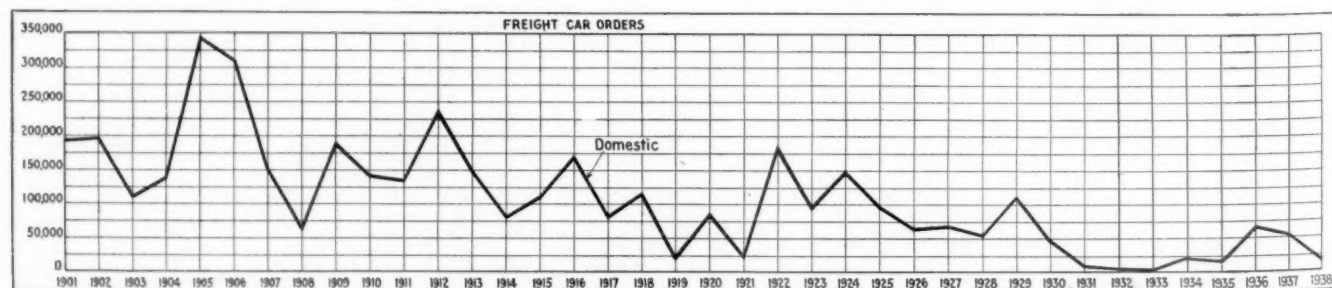
Table II—Orders for Freight Cars Since 1901

DOMESTIC ORDERS			
Year	Freight cars	Year	Freight cars
1901	193,439	1908	62,669
1902	195,248	1909	189,360
1903	108,936	1910	141,024
1904	136,561	1911	133,117
1905	341,315	1912	234,758
1906	310,315	1913	146,732
1907	151,711	1914	80,264

DOMESTIC AND FOREIGN				
Year	Domestic	Canadian	Export	Total
1915	109,792	.....	18,222	128,014
1916	170,054	.....	35,314	205,368
1917	79,367	.....	53,191	132,558
1918	114,113	9,657	53,547	177,317
1919	22,062	3,837	3,994	29,893
1920	84,207	12,406	9,056	105,669
1921	23,346	30	4,982	28,358
1922	180,154	746	1,072	181,972
1923	94,471	8,685	396	103,552
1924	143,728	1,867	4,017	149,612
1925	92,816	642	2,138	95,596
1926	67,029	1,495	1,971	70,495
1927	72,006	2,133	646	74,785
1928	51,200	8,901	2,530	62,631
1929	111,218	9,899	3,023	124,140
1930	46,360	1,936	1,200	49,496
1931	10,880	3,807	151	14,838
1932	1,968	501	77	2,546
1933	1,685	75	132	1,892
1934	24,611	12	1,323	25,946
1935	18,699	2,421	110	21,230
1936	67,544	271	526	68,341
1937	52,738	7,397	1,369	61,504
1938	16,539	4,902	442	21,883

Prior to 1918, Canadian orders included in "Domestic."

Freight cars built in the United States during 1938 for domestic service, as distinguished from cars ordered, totaled 17,473, as compared with 75,003 completed in 1937. For export, American builders produced 549 cars during the year, as compared with 1,121 in 1937. Ca-



Freight Car Orders from 1901 to 1938

nadian plants turned out 5,115 cars, of which 5 were for export, as compared with 6,595 in 1937. With the exception of the latter year, the Canadian 1938 volume exceeds that of each year since 1930.

The foregoing production figures should not be confused with the totals of orders placed. Nor are they comparable with the figures on the number of cars installed as reported in statistics issued by the Association of American Railroads.

The appended tables contain a detailed statement of orders for new freight cars, or those having new bodies, placed during 1938 by railroads and industrial concerns; also those placed in Canada and for export. The list of orders was compiled from information furnished to the *Railway Age* by the railroads, private car lines, and other purchasers of cars, in response to requests for this

Year	United States			Canadian			Grand total
	Domestic	Foreign	Total	Domestic	Foreign	Total	
1919.....	94,981	61,783	156,764	6,391	30	6,421	163,185
1920.....	60,955	14,480	75,435	.....	.....	.....	.....
1921.....	40,292	6,412	46,704	8,404	745	9,149	55,853
1922.....	66,289	1,126	67,415	458	100	558	67,973
1923.....	175,748	2,418	178,166	.....	.....	.....	.....
1924.....	113,761	1,141	114,902	1,721	.....	1,721	116,623
1925.....	105,935	3,010	108,945	.....	.....	.....	.....
1926.....	88,862	2,771	91,633	1,645	.....	1,645	93,278
1927.....	63,390	1,087	64,477	2,851	.....	2,851	67,328
1928.....	46,060	938	46,998	5,158	.....	5,158	52,156
1929.....	82,240	3,168	85,408	8,557	.....	8,557	93,965
1930.....	75,188	1,909	77,097	6,923	.....	6,923	84,020
1931.....	13,205	409	13,614	4,633	.....	4,633	18,247
1932.....	3,254	82	3,336	.....	.....	.....	3,336
1933.....	2,160	151	2,311	550	.....	550	2,861
1934.....	25,176	151	25,327	.....	.....	.....	25,327
1935.....	6,933	888	7,821	801	.....	801	8,622
1936.....	45,822	493	46,315	1,800	.....	1,800	48,115
1937.....	75,003	1,121	76,124	6,595	.....	6,595	82,719
1938.....	17,473	549	18,022	5,110	5	5,115	23,137

* Includes Canadian output.

† Includes Canadian output and equipment built in company shops.

Table III—Freight Cars Built in 1938

	United States	Canada	Total
Domestic	17,473	5,110	22,583
Foreign	549	5	554
Total	18,022	5,115	23,137

COMPARISON WITH PREVIOUS YEARS

Year	Domestic	Foreign	Total	Year	Domestic	Foreign	Total
1899.....	117,982	1,904	119,886	1906*..	236,451	7,219	240,503
1900.....	113,070	2,561	115,631	1907*..	280,216	9,429	284,188
1901.....	132,591	4,359	136,950	1908*..	75,344	1,211	76,555
1902.....	161,747	2,800	162,599	1909*..	91,077	2,493	93,570
1903.....	153,195	1,613	152,801	1910*..	176,374	4,571	180,945
1904.....	60,955	1,995	60,806	1911*..	68,961	3,200	72,161
1905*..	162,701	5,305	165,155	1912*..	148,357	4,072	152,429

Year	United States			Canadian			Grand total
	Domestic	Foreign	Total	Domestic	Foreign	Total	
1913.....	176,049	9,618	185,667	22,017	.....	22,017	207,684
1914.....	97,626	462	98,088	6,453	.....	6,453	104,451
1915.....	58,226	11,916	70,142	1,758	2,212	3,970	74,112
1916.....	111,516	17,905	129,421	.....	.....	5,580	135,001
1917.....	115,705	23,938	139,643	3,658	8,100	11,758	151,401
1918.....	67,063	40,981	108,044	14,704	1,960	16,664	124,708

information. The data thus furnished were then checked against lists of orders supplied by the car builders, and amplified accordingly, and also against the weekly reports of orders appearing in the Equipment and Supplies column of the *Railway Age*. The production figures were secured in response to requests to the car builders for this information. As in former years, the *Railway Age* is especially indebted to the American Railway Car Institute for its assistance in making available reports of the companies affiliated with that organization.

The *Railway Age* is not sufficiently optimistic to believe that the lists can include all the orders placed or that the figures of production are of scientific accuracy. However, it is believed that such omissions as occur will be found to be small and unimportant, and will not vitiate the value of the figures, particularly with respect to comparisons with preceding years, which, after all, is the primary purpose of the compilations.

Freight Car Orders in 1938

For Service in the United States

Purchaser	No.	Class	Capacity	Length ft. in.	Construction	Weight	Date of order	Date of delivery	Builder
Bangor & Aroostook.....	500	D. S. Box	80,000	40 5	Steel	47,000	March	September	Magor
	115	Hopper	140,000	40 8	Steel	48,000	March	September	Bethlehem
	50	Rack	100,000	48 6	Steel	48,800	March	July	Greenville
Bessemer & Lake Erie.....	100	Flat	100,000	50 0	Steel	44,700	November	Jan., '39	Amer. Car & Fdy.
	100	Box	100,000	.....	Steel	.....	August	August	Pullman-Standard
Bethlehem Steel Co.....	7	Air Dump	140,000	.....	.....	.....	July	.....	Austin-Western
Board of Trans. New York City...	4	Flat	60,000	44 7½	St. Underframe	38,000	October	.....	St. Louis Car Co.
Canfield Tank Line Co.....	4	Tank	80,000	.....	Steel	37,700	January	March	General American
Champion Paper & Fiber Co.....	2	Tank	8,000g	36 3	Steel	43,500	May	July	Amer. Car & Fdy.
Chesapeake & Ohio.....	25	Cov. Hopper	140,000	29 3	Steel	52,100	January	May	Amer. Car & Fdy.
Chicago, Burlington & Quincy.....	100	Ballast	100,000	33 4½	Steel	46,100	January	May	Amer. Car & Fdy.
Chicago Great Western.....	50	D. S. Box	100,000	40 6	Alloy Steel	36,000	June	July	Pullman-Standard
Chicago, Milw., St. Paul & Pacific..	35	Gondola	140,000	48 6	Steel Frame	53,000	February	April	Company Shops
	469	Flat	100,000	52 6	Steel	45,700	June	December	Company Shops
Cities Service Oil Co.....	1	Tank	8,000g	.....	.....	.....	July	October	General American
Columbian Gasoline Corp.....	17	Cov. Hopper	80,000	45 10½	Steel	49,300	August	October	Amer. Car & Fdy.
Cons. Chem. Industries Inc.....	2	Tank	7,000g	32 3	Steel	42,680	March	April	Amer. Car & Fdy.
	2	Tank	7,000g	32 3	Steel	42,680	June	July	Amer. Car & Fdy.
Cornwall.....	20	Ore	140,000	19 11	Steel	40,200	October	December	Bethlehem
Detroit-Edison Co.....	6	Gondola (Bod.)	130,000	35 0	Steel	45,800	April	June	Hafner-Thrall
Dow Chemical Co.....	2	Tank	8,000g	36 3¾	Steel	56,630	January	April	Amer. Car & Fdy.
Ethyl Gasoline Corp.....	12	Tank	3,000g	26 9¾	Steel	53,000	1938	July-Sept.	Amer. Car & Fdy.
	6	Tank	6,000g	30 6½	Steel	65,000	1938	July	Amer. Car & Fdy.
Fleischmann Transportation Co....	6	Tank	100,000	.....	Wood Tank	.....	1938	1938	Company Shops
Hercules Powder Co.....	3	Tank	6,000g	.....	Steel	53,000	April	June	General American
	1	Tank	8,000g	.....	Alum. Tank	45,000	November	December	General American
Huber, Inc., J. M.....	4	Cov. Hopper	80,000	45 10½	Steel	49,400	July	October	Amer. Car & Fdy.
Illinois Central.....	1000	D. S. Box	80,000	40 6	Steel	46,600	September	December	Amer. Car & Fdy.
	1000	Box	80,000	40 6	Steel	46,600	November	Apr., '39	Amer. Car & Fdy.
	100	Flat (Bod.)	.....	.....	.....	.....	November	.....	Company Shops
Kansas City Southern.....	20	Pulpwood	140,000	31 0	Steel	54,600	January	March	Amer. Car & Fdy.
Kennecott Cop. Corp. (Nev. C. C. C.)	30	Air Dump	100,000	31 0	Alloy Steel	67,000	October	Jan., '39	Austin-Western
	12	Air Dump	100,000	31 0	Alloy Steel	67,000	November	Feb., '39	Austin-Western
Lake Terminal.....	100	Gondola	140,000	50 6	Steel	53,706	November	Dec.-Jan., '39	Pressed Steel
Lehigh & New England.....	50	Cov. Hopper	140,000	26 3¾	Steel	54,100	July	September	Amer. Car & Fdy.
Lone Star Gasoline Co.....	2	Tank	100,000	38 1	Steel	63,900	September	November	Amer. Car & Fdy.
Louisiana & Arkansas.....	255	Pulpwood	140,000	.....	Steel	55,000	December	May, '39	Amer. Car & Fdy.
Mathieson Alkali Wks.....	3	Ins. Box	100,000	40 1½	Steel	69,520	January	April	Amer. Car & Fdy.
Missouri-Pacific.....	100	Flat	100,000	45 0	Steel	46,000	April	October	Company Shops
	215	Stock	80,000	40 ½	St. Underframe	43,000	November	December	Company Shops
	9	Air Dump	100,000	34 0	Steel	71,000	July	October	Pressed Steel
Monessen Southwestern.....	1	Tank	8,000g	36 3¾	Steel	44,240	March	April	Amer. Car & Fdy.
Monsanto Chemical Co.....	1	Tank	8,000g	36 3¾	Steel	44,240	September	September	Amer. Car & Fdy.
	1	Tank	8,000g	.....	Steel	44,240	March	May	General American
	3	Tank	8,000g	.....	Steel	44,240	September	September	General American
	1	Tank	6,000g	.....	Steel	44,240	October	December	General American
	2	Tank	8,000g	.....	Steel	44,240	May	July	General American

Purchaser	No.	Class	Capacity	Length Ft. In.	Construction	Weight	Date of order	Date of delivery	Builder
Morrison-Knudsen Co.	19	Air Dump	100,000				1938		Austin-Western
Niagara Smelting Corp.	1	Tank	60,000	34 2	Steel	65,100	March	May	Amer. Car & Fdy.
Norfolk & Western	750	Hopper	110,000		Steel		January	February	General American
	750	Hopper	110,000		Steel		December		Bethlehem
	500	Box	100,000	40 0	Steel		December		Virginia Bridge
	100	Box	100,000	50 0	Steel		December		Pressed Steel
	35	Cov. Hopper	140,000		Steel		December		Greenville
Pennsylvania	1000	Gondola	140,000	52 0	Steel	57,000	June	November	Company Shops
	6	Well	250,000	51 7	Steel	97,600	June	November	Company Shops
	2	Flat	375,000	44 0	Steel	104,400	June	November	Company Shops
Pennsylvania Salt Mfg. Co.	5	Tank	60,000	33 10	Steel	65,100	April	July	Amer. Car & Fdy.
	4	Tank	4,000g	28 7 $\frac{3}{4}$	Steel	35,600	July	September	Amer. Car & Fdy.
	1	Tank	8,000g	42 7 $\frac{1}{2}$	Steel	78,500	October	December	Amer. Car & Fdy.
	2	Tank	60,000				April	May	General American
Phillips Petroleum Co.	10	Tank	100,000	41 5 $\frac{1}{2}$	Steel	69,000	April	April-May	General American
Pittsburgh Plate Glass Co.	2	M. U. Tank					June	July	General American
Royster Guano Co., F. S.	1	Tank	4,000g				November	Dec.-Jan., '39	General American
	4	Tank	7,000g				November	Dec.-Jan., '39	General American
St. Louis-San Francisco	2	Box	100,000	40 6	Steel	46,400		Jan.-Feb.	Company Shops
	5	Box	100,000	40 6	Steel	46,400		November	Company Shops
	21	Caboose	80,000	29 0	Steel Frame	45,600		Feb.-Oct.	Company Shops
Semet-Solvay Co.	10	Tank	10,000g	36 3 $\frac{3}{4}$	Steel	46,000	June	September	Amer. Car & Fdy.
	1	Tank	10,000g	35 10	Steel	46,500	September	October	Amer. Car & Fdy.
Shell Chemical Co.	4	Tank	50,000				January	May	General American
Shippers' Car Line	40	Tank	50,000	42 7 $\frac{1}{2}$	Steel	76,000	March	March	Amer. Car & Fdy.
	5	Tank	60,000	34 2	Steel	65,100	October	October	Amer. Car & Fdy.
	1	Tank	50,000	42 7 $\frac{1}{2}$	Steel	75,700	October	October	Amer. Car & Fdy.
	1	Tank	10,500g	40 5	Steel	73,000	October	October	Amer. Car & Fdy.
Solvay Process Co.	1	Tank	4,500g	30 2	Steel	34,400	August	November	Amer. Car & Fdy.
Southern Acid & Sulphur	2	Tank	8,000g				September	November	General American
Southern Alkali Co.	3	Tank	60,000				August	November	General American
Southern Railway	2044	Box	80,000	40 6	Steel	44,500	May	Sept.-Dec.	Pullman-Standard
	1020	Box	80,000	40 6	Steel	44,500	May	Sept.-Nov.	Mount Vernon
	200	Furniture	100,000	50 6	Steel	53,500	May	Nov.-Dec.	Mount Vernon
	50	M. T. Gon.	140,000	65 0	Steel	67,200	May	Nov.-Dec.	Mount Vernon
	1345	D. B. Gon.	100,000	41 9	Steel	46,300	May	Aug.-Oct.	Amer. Car & Fdy.
	253	Stock	80,000	40 6	Steel Frame	43,000	May	Oct.-Nov.	Ralston
	101	Flat	140,000	50 0	St. Underframe	56,000	May	Sept.-Oct.	Greenville
	711	L. S. Gon.	100,000	41 6	Steel	42,200	May	Sept.-Oct.	Pressed Steel
	1332	Box	80,000	40 6	Steel	44,500	October	Jan.-Mar., '39	Pullman-Standard
	1032	D. B. Gon.	100,000	41 9	Steel	46,300	October	Jan.-Mar., '39	Mount Vernon
	100	Stock	80,000	40 6	Steel Frame	43,000	October	Jan., '39	Ralston
Tennessee Eastman Corp.	1	Tank	4,000g	28 7 $\frac{3}{4}$	Steel	41,600	October	December	Amer. Car & Fdy.
	5	Tank	8,000g	37 3 $\frac{3}{4}$	Aluminum	35,500	November	Jan., '39	Amer. Car & Fdy.
Union Pacific	50	Box			Steel		August	August	Pullman-Standard
Union Tank Car Co.	20	Tank	100,000		Steel			April	Company Shops
United States Navy Dept.	5	Flat	100,000	40 0	St. Underframe	38,800	March	June	Amer. Car & Fdy.
	1	Hopper	100,000	30 0	Steel	37,820	March	May	Amer. Car & Fdy.
	2	Tank	8,000g	36 3 $\frac{3}{4}$	Steel	42,500	April	June	Amer. Car & Fdy.
	1	Box	100,000	40 6	Steel	45,600	May	June	Amer. Car & Fdy.
	1	Hopper	100,000	33 0	Steel	44,500	January	March	General American
	3	Flat	200,000				March		Haffner-Thrall
	39	Flat	100,000				June		Haffner-Thrall
U. S. Sugar Corp.	20	Cane	60,000	39 3 $\frac{3}{4}$	Steel	32,825	December	December	Magor
United States War Dept.	25	Tank	10,000g	36 3 $\frac{3}{4}$	Steel	47,200	June	September	Magor
	25	Tank	10,000g	36 3 $\frac{3}{4}$	Steel	47,200	January	March	Amer. Car & Fdy.
Western Pacific	12	Caboose					September	November	Amer. Car & Fdy.
Wheeling & Lake Erie	400	Hopper	120,000				1938	1938	Company Shops
White Pass & Yukon Route	1	Tank			Steel		December	1938	Ralston
									Company Shops

§Incorrectly reported in 1937 as built in railroad company's shops.
 ¶Leased.

Export

Purchaser	No.	Class	Capacity	Length Ft. In.	Construction	Weight	Date of order	Date of delivery	Builder
Banco Nac. Obr. de Eomento Ind. (Mex.)	50	Cane	60,000	38 6	Steel	32,040	September	November	Magor
Brazilian Portland Cement	20	Hopper	20,000	16 5	Steel	11,760	April	August	Magor
Chile Exploration Co.	12	Dump	140,000				February		Differential
Ferroc. Elec. Pac. (Costa Rica)	6	Air Dump	66,120	25 3	Steel	38,888	March	May	Magor
Manila Railroad Company	50	S. S. Box	66,000	35 11	Steel	31,420	June	December	Pressed Steel
Mitsui & Co., Ltd. (Manchukuo)	18	Air Dump	100,000	37 6	Steel	68,525	May	September	Magor
	18	Air Dump	100,000	37 6	Steel	68,525	September	Oct.-Nov.	Magor
O'Okiep Copper Co., Ltd. (S. Africa)	4	Tank	4,000g				March	October	Atlas Car & Mfg.
	4	Flat	40,000				March	July	Atlas Car & Mfg.
Paulista Ry. (Brazil)	125	Flat	92,593	36 9	Steel	31,842	January	April	Pullman-Standard
	125	Gondola	92,593	36 9	Steel	35,473	January	April	Pullman-Standard
United Fruit Co. (Guatemala)	10	Tank	7,500g	39 0	Steel	36,203	May	September	Magor

Canada

Purchaser	No.	Class	Capacity	Length Ft. In.	Construction	Weight	Date of order	Date of delivery	Builder
British American Oil Co.	5	Tank	10,000g	33 7 $\frac{1}{2}$	Steel	59,300	March		Can. Car & Fdy.
	11	Tank	6,000g	33 3	Steel	39,300	March	June	National Steel
	8	Ins. Tank	6,000g	33 3	Steel	46,200	March	June	National Steel
	5	Ins. Tank	8,000g	37 7	Steel	51,500	March	June	National Steel
Canadian General Transit Co.	8	Tank	80,000	33 0	Steel	39,400	February	April	Can. Car & Fdy.
Canadian National	600	S. S. Box	80,000	40 6	Steel	44,000	February	Apr.-June	Can. Car & Fdy.
	700	S. S. Box	80,000	40 6	Steel	44,600	February	June-July	National Steel
	700	S. S. Box	80,000	40 6	Steel	44,300	February	May-August	Eastern Car Co.
	25	Sand	140,000	31 2	Steel	53,000	April	Aug.-Sept.	Company Shops
Canadian Pacific	1000	D. S. Box	80,000	40 6	Steel	44,500	March	August	Can. Car & Fdy.
	950	D. S. Box	80,000	40 6	Steel	44,500	March	September	National Steel
	50	D. S. Auto	80,000	40 4 $\frac{3}{4}$	Steel	48,500	March	August	Can. Car & Fdy.
	100	Gondola	150,000	48 6 $\frac{3}{4}$	Steel	49,800	March	May	National Steel
	200	Coal	100,000	33 0	Steel	42,900	March	May	National Steel
	50	Ore	150,000	23 9	Steel	51,400	March	November	Eastern Car
	200	Flat	100,000	46 0	Steel	38,800	March	September	Can. Car & Fdy.
	200	Stone	100,000	39 7 $\frac{1}{2}$	Composite	40,900	March	August	Can. Car & Fdy.
	50	Refrigerator	75,000	39 4 $\frac{1}{2}$	St. Underframe	61,000	March	Feb., '39	Company Shops
International Nickel Co.	20	Ore	160,000	23 2	Steel	47,400	January	March	National Steel
Steel Co. of Canada	15	Gondola	100,000	48 6	Steel	48,000	April	May	National Steel

Canada — Export

Purchaser	No.	Class	Capacity	Length Ft. In.	Construction	Weight	Date of order	Date of delivery	Builder
Trinidad Government	5	Flat	100,000	36 0			July		Can. Car & Fdy.

Passenger-Train Cars Ordered in 1938

Total of 269 cars purchased is 32 per cent of 1937 volume; 12 rail-motor cars ordered, Export market remains at zero

By Frank W. Kraeger
Associate Editor

AMERICAN car builders received domestic orders for a total of 269 passenger-train cars during 1938, which is some 32 per cent of the number of cars ordered during 1937 and 88 per cent of those in 1936.

This total includes all revenue passenger-train cars, in-

cluding members of articulated units, except those containing power plants, which are listed and totaled separately as rail-motor cars. Orders were placed during the year for 12 units of the latter type, which volume is just double the number of rail-motor cars purchased in 1937. So-called "cars" placed at the head of streamliners and devoted entirely to the housing of power plant facilities and classed as non-revenue, are listed under locomotives elsewhere in this issue.

Railroad company shops received orders for 82, or 30 per cent of the passenger cars ordered. In 1937, com-

Table I—Passenger-Train Car Orders in 1938

For service in the United States	269
For service in Canada	24
For export to other countries .....	..
Grand Total	293

Table II—Orders for Passenger-Train Cars Since 1901

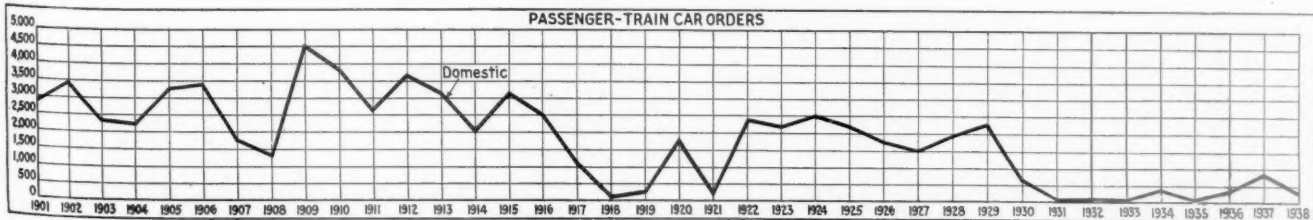
DOMESTIC ORDERS ONLY			
Year	Passenger cars	Year	Passenger cars
1901.....	2,879	1909.....	4,514
1902.....	3,459	1910.....	3,881
1903.....	2,310	1911.....	2,623
1904.....	2,213	1912.....	3,642
1905.....	3,289	1913.....	3,124
1906.....	3,402	1914.....	1,674
1907.....	1,791	1915.....	1,978
1908.....	1,319		
DOMESTIC AND FOREIGN			
Year	Domestic	Canadian	Export
1916.....	2,302	...	109
1917.....	1,124	...	43
1918.....	109	22	26
1919.....	292	347	143
1920.....	1,781	275	38
1921.....	246	91	155
1922.....	2,382	87	19
1923.....	2,214	263	6
1924.....	2,554	100	25
1925.....	2,191	50	76
1926.....	1,868	236	58
1927.....	1,612	143	48
1928.....	1,930	334	29
1929.....	2,303	122	33
1930.....	667	203	15
1931.....	11	11	21
1932.....	39	...	39
1933.....	6	...	6
1934.....	388	...	15
1935.....	91*	16	107*
1936.....	307†	10	317†
1937.....	829	99	928
1938.....	269	24	293

Table III—Passenger-Train Cars Built in 1938

	United States	Canada	Total
Domestic.....	264	38	302
Foreign.....	...	...	...
	<hr/> 264	<hr/> 38	<hr/> 302
Comparison with Previous Years			
Year	Domestic	Foreign	Total
1899.....	1,201	104	1,305
1900.....	1,515	121	1,636
1901.....	1,949	106	2,055
1902.....	From 1902 to 1907		
1903.....	passenger car figures		
1904.....	in these two		
1905*	columns included in		
1906*	corresponding		
1907*	freight car columns.		
1908*	1,645	71	1,716
1909*	2,698	151	2,849
1910*	4,136	276	4,412
1911*	3,938	308	4,246
1912*	2,822	238	3,060

* Includes Canadian output.
† Includes Canadian output and equipment built in company shops.

United States			Canadian			Grand total
Year	Domestic	Foreign	Domestic	Foreign	Total	
1913.....	2,559	220	517	...	517	3,296
1914.....	3,310	56	325	...	325	3,691
1915.....	1,852	14	83	...	83	1,949
1916.....	1,732	70	37	...	37	1,839
1917.....	1,924	31	45	...	45	2,000
1918.....	1,480	92	1	...	1	1,573
1919.....	306	85	391	...	160	551
1920.....	1,272	168	1,440	...	...	1,440
1921.....	1,275	39	1,314	...	361	1,675
1922.....	676	144	820	...	71	891
1923.....	1,507	29	1,536	...	...	1,536
1924.....	2,150	63	2,213	...	167	2,380



Passenger-Train Car Orders from 1901 to 1938

Year	United States			Canadian			Grand total
	Domestic	Foreign	Total	Domestic	Foreign	Total	
1925.....	2,363	50	2,413	...	...	...	2,411
1926.....	2,184	102	2,286	285	...	285	2,571
1927.....	1,785	50	1,835	126	...	126	1,963
1928.....	1,356	15	1,371	237	...	237	1,608
1929.....	1,254	20	1,274	162	...	162	1,436
1930.....	1,264	40	1,304	210	...	210	1,514
1931.....	198	21	219	66	...	66	285
1932.....	39	...	39	...	...	...	39
1933.....	6	...	6	...	...	...	6
1934.....	268	15	283	...	...	...	283
1935.....	197	...	197	...	...	...	197
1936.....	142	...	142	10	...	10	152
1937.....	664	...	664	70	...	70	734
1938.....	264	...	264	38	...	38	302

pany shops received orders for 64 of the total of 829 cars purchased.

No export passenger-train car orders were received during 1938, thus making the fourth successive year in which this field has been entirely inactive for American

builders. For the second successive year, no rail-motor cars were ordered from abroad.

Canadian builders received orders during the year for 24 cars, which volume exceeds that for each year since 1930, except 1937, when orders were received for 99 units.

Passenger-train cars built in the United States for domestic service during 1938, as distinguished from cars ordered, totaled 264, as compared with 664 cars turned out during 1937. No cars for export were built. Canadian builders completed 38 cars during the year, as compared with 70 in 1937.

The accompanying lists of orders, amplifying the summary tables also published herewith, have been compiled in the usual way. Returns from railroads were checked against lists of orders, supplied by the car builders, largely through the courtesy of the American Railway Car Institute.

Passenger-Train Car Orders in 1938

For Service in the United States

Purchaser	No.	Class	Length Ft. In.	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
Alabama Great Southern.....	2 AC	Coach	63 10	76	102,000	September	April	St. Louis Car Co.
Bangor & Aroostook.....	1	Bag. & Mail	74 5½	...	96,000	March	June	Pullman-Standard.
Burlington-Rock Island.....	1†	Coach	64 0	60	55,335	1938	.....	Budd
Chicago, Burlington & Quincy.....	2	Sleeping	87 6	...	107,900	1938	1939	Budd
	1 AC	Chair	88 8	70	106,900	1938	1939	Budd
	1 AC	Chair	79 8	52	98,200	1938	1939	Budd
Chicago, Milwaukee, St. Paul & Pacific...	1 AC	Din. O. P. & L.	88 7	46	116,400	1938	1939	Budd
	4 AC	Tap Room-Bag.	80 11	44	98,800	March	September	Company Shops
	4 AC	Diner	80 11	48	105,400	March	September	Company Shops
	6 AC	Parlor	80 8¾	40	93,300	March	August	Company Shops
	4 AC	Rear End Parl.	80 8¾	45	91,700	March	September	Company Shops
	15 AC	Coach	80 8¾	70	93,400	March	August	Company Shops
	2	Ry. Post Off.	62 4	...	90,100	March	September	Company Shops
	10	Pass. & Bag.	57 2½	24	56,380	March	June	Company Shops
	10	P. Bag. & Mail	70 7	26	71,600	March	July	Company Shops
	1 AC	Coach	80 8¾	70	93,400	March	November	Company Shops
	1 AC	Coach-Bunk	80 8¾	72	94,000	March	November	Company Shops
	3	Mail & Exp.	74 3	...	94,000	March	November	Company Shops
	1	Baggage	74 3	...	90,000	March	November	Company Shops
Great Northern.....	6	Coach	81 11¼	52	168,620	July	July	Pullman-Standard
Mississippi Central.....	1	Bag. & Exp.	...	...	...	.....	1938	Company Shops
Missouri-Pacific.....	4	Bag. & Exp.	70 6	...	126,000	June	December	Company Shops
New York, New Haven & Hartford.....	30	Coach	82 4½	84	108,000	February	July-Oct.	Pullman-Standard
	20	Coach	82 4½	92	108,000	February	July-Oct.	Pullman-Standard
Pennsylvania.....	2 AC	Coach	84 8	66	105,000	August	December	Budd
Pullman Company.....	84	Sleeping	70 9½	...	...	1938	.....	Pullman-Standard
St. Louis-San Francisco.....	1	Baggage	66 9	...	144,000	.....	September	Company Shops
	2	Baggage	70 0	...	142,900	.....	Sept.-Oct.	Company Shops
	5	Baggage	70 0	...	133,500	.....	Nov.-Dec.	Company Shops
	3	Chair	72 9¾	64	159,600	Sept.-Oct.	.....	Company Shops
	2	Coach-Mail	70 8¾	44	165,600	.....	Nov.-Dec.	Company Shops
	2	Coach-Bag.	70 1	32	160,800	.....	Nov.-Dec.	Company Shops
Seaboard Air Line.....	1 AC	Pass. & Bag.	82 4	22	109,000	October	Jan., '39	Budd
	3 AC	Coach	82 4	60	190,000	October	Jan., '39	Budd
	1 AC	Coach-Tavern	82 4	60	106,970	October	Jan., '39	Budd
	1 AC	Diner	82 4	48	121,200	October	Jan., '39	Budd
	1 AC	Coach-Obs.	83 8	72	99,500	October	Jan., '39	Budd
Southern.....	4 AC	Coach	63 10	76	102,000	September	Apr., '39	St. Louis Car Co.
White Pass & Yukon Route.....	25	Bag.-Exp.	70 9	...	117,000	October	Mar., '39	Bethlehem
	1	.....	...	...	.....	.....	1938	Company Shops

Canada

Purchaser	No.	Class	Length Ft. In.	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
Canadian National.....	10 AC	Buffet-Sleep.	80 8¼	50	.....	February	Dec.-Jan., '39	Can. Car & Fdy.
	6 AC	Diners	83 1	40	163,500	February	Aug.-Sept.	Can. Car & Fdy.
	5	Mail & Exp.	73 6	...	150,000	February	May	Can. Car & Fdy.
Newfoundland.....	2	Sleeping	61 6½	36	90,000	April	November	National Steel
	1	Dining	57 3	24	85,000	April	November	National Steel

AC—Indicates cars are air-conditioned.

†—Body units of articulated or partially articulated trains.

Rail-Motor Cars

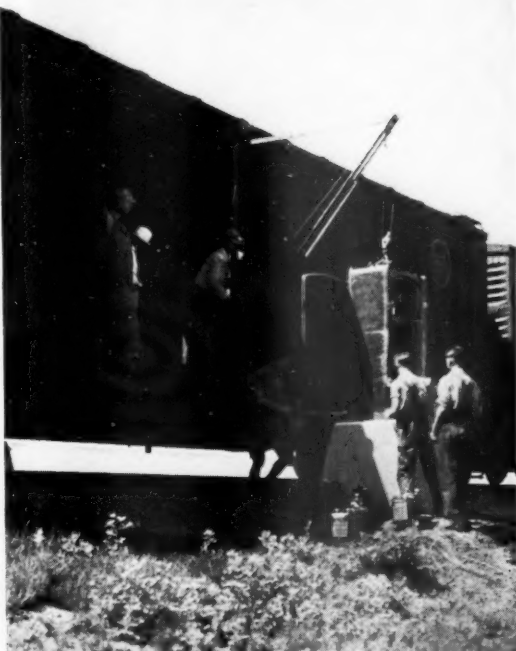
For Service in the United States

Road	No.	Type of Power Plant	Horse- Power	Seating Capacity	Length of Bagg. Compt. Ft. In.	Weight	Builder
Alabama Great Southern.....	2	Diesel-Elec.	750	...	38 0	181,000	St. Louis-Fairb. M.-W.
Chicago, Burlington & Quincy.....	1	Diesel-Elec.	1000	...	40 0	198,600	Budd-Electro-M.
Fonda, Johnstown & Gloversville.....	1	Gas-Elec.	300	...	60 0	103,000	J. G. Brill Co.
Missouri & Arkansas.....	2	Gasoline	200	66	29 3¼	132,000	Amer. Car & Fdy.
Panama R. R. Co.....	1	Gasoline	250	46	14 0	55,000	Edwards-Buda
	1	Trailer-Coach	...	56	...	35,000	Edwards
Southern.....	4	Diesel-Elec.	750	...	38 0	181,000	St. Louis-Fairb. M.-W.

Signaling Construction Decreased in 1938

Thirty per cent less equipment installed than in 1937 — Interlockings gain but automatic block takes a drop

By John H. Dunn
Signaling Editor



The Missouri Pacific, the Wabash, and the Rock Island Handled Extensive Signal Construction Programs in 1938

SIGNALING construction, in the United States and Canada, as a whole, decreased in 1938, a total of 4,572 units being placed in service, as compared with 6,599 in 1937. Although this represents a reduction of 2,027 units, the 1938 total exceeds that for the years 1932 to 1936, inclusive, the low in recent years being 2,837 units in 1932, while the peak was in 1930 when 17,499 units were installed. The installation of new levers of interlocking increased more than 100 per cent in 1938, compared with 1937, owing to the construction of several large terminal plants, but the mileage of new automatic block signaling installed in 1938 was less than half that for the previous year. The construction of car retarders, as well as remote and centralized traffic control, was almost equal to that of 1937, but the number of railroad-highway crossings at which automatic protection was installed decreased from 1,225 in 1937 to 897 in 1938.

From the standpoint of the manufacturers of signaling equipment, 1938 was a much worse year than is indicated by the comparison above since several of the large installations completed in 1938, such as the interlockings on the Baltimore & Ohio at Chicago, on the Bay Bridge at San Francisco, and the Union Terminal at Los Angeles, as well as the retarders at Clearing, Ill., were planned and under way prior to January, 1938. These projects include a large percentage of the total units placed in service during 1938. With the exception of the automatic signaling installed on the Rock Island, few extensive projects were planned and completed in 1938. The net result is that the equipment and materials actually manufactured for new installations in the signaling field dropped to very low totals in 1938.

During 1938, new automatic block signaling was placed in service on only 575 miles of track, which is a decided drop from 1,332 miles in 1937. Of the new signaling completed, 422 miles are on the Rock Island, with 339 miles between Pratt, Kan., and Tucumcari, N. M., and 83 miles between Manly, Iowa, and Inver Grove, Minn. The Missouri Pacific made two installations totaling 57 track miles; the Wabash made two installations totaling

Comparison of Annual Signaling Construction

	(Number of Units Completed Each Year)					
	1933	1934	1935	1936	1937	1938
Automatic block signals	1,189	372	749	838	2,111	674
Highway crossing signals	1,010	768	1,252	2,234	2,683	1,995
Levers of interlocking	782	307	468	554	315	688
Levers added at rebuilt plants.	106	433	182	99	63	173
Levers of remote and centralized traffic control	159	141	93	140	259	246
Power-operated switches in remote and centralized traffic control	67	89	50	86	143	129
Signals controlled in remote and centralized traffic control ...	228	198	124	205	438	450
Signals in automatic interlockings	134	152	124	117	141	41
Spring switches	42	47	79	216	406	132
Number of retarders	3	..	..	..	40	44
Totals	3,720	2,507	3,121	4,489	6,599	4,572

49 track miles, and the Chicago, North Shore & Milwaukee equipped 24 miles of double track. The remainder of the installations made in 1938 were comparatively short—15 miles or less.

A comparatively few programs involving the modernization of old signaling were completed in 1938. The New York Central replaced semaphores with color-light signals on 80 miles of road involving 221 track miles

between Toledo, Ohio, and Elyria. As a part of an electrification program on lines between Paoli, Pa., and Harrisburg, the Pennsylvania replaced previous automatic signaling with continuous code-control wayside and cab signaling, this including 315 miles of road and

Interlocking Plants Completed During 1938

Railroad	Location	Manu- fac- turer	Lever Capac- ity of Frame	Working Levers				
				Mechanical	Electric	Electro Pneumatic	Mech.	Elec.
A. C. L.	Pee Dee, S. C.†	Union	8	6	..	3†	..	..
B. & O.	Franklin Jct., Va.	Union	40	..	40	..	..	..
C. N.	Chicago, Ill. (1)	G.R.S.	2	..	2	..	..	..
C. P.	Frederickton, N. B.	G.R.S.	8	2†	..	..	..	..
	Oba, Ont.†	Saco	1	1	..	..	..	..
	Galt, Ont.	Saco	1	1	..	..	..	..
	Winnipeg, Man. (3)†	Union	72	..	..	..	..	..
C. of N. J.	Elizabethport, N.J. (1)	Union	78	..	78	..	..	..
C. B. & Q.	Bushnell, Ill.	Union	7	..	7	..	..	..
C. M. St. P. & P.	Chicago, Ill.†	Union	83	..	..	69†	..	..
Erie	Jefferson Jct., Pa. (4)†	Union	24	..	..	..	..	..
	Mongaup Pa.	Union	2	..	2	..	..	..
I. R. T.	Willits Point, N. Y.	Union	23	..	..	23	..	..
L. A. U. T.	Los Angeles, Cal.	Union	155	..	..	138	..	..
	Mission Tower, Cal.	G.R.S.	104	..	106	..	..	..
N. Y. C.	North Findlay, O. (5)	G.R.S.	2	..	2	..	..	..
Pa.	Harrison, N. J.†	Union	83	..	..	13†	..	..
	Edgewood, Md.†	Union	35	..	..	..	..	..
	Harrisburg, Pa.	Union	127	..	..	112	..	..
	Parkesburg, Pa.†	Union	39	..	..	1†	..	..
	Thorndale, Pa. (6)†	Union	120	..	..	18†	..	..
	Columbia, Pa. (6)†	Union	120	..	..	31†	..	..
P. M.	Reed City, Mich.	Union	3	..	3	..	..	..
Phila., City of	Philadelphia, Pa.	Union	11	..	..	7	..	..
S. F. O. B. B.	San Francisco, Cal. (1)	G.R.S.	66	..	66	..	..	..
	Oakland, Cal. (1)	G.R.S.	89	..	89	..	..	..
S. A. L.	Rockets, Va. (7)	Union	1	..	..	1	..	..
	LaCrosse, Va. (7)	Union	1	..	..	1	..	..
	Freemans, N. C. (7)	Union	1	..	..	1	..	..
	Spaulding, S. C. (7)	Union	1	..	..	1	..	..
	Thalman, Ga. (7)	Union	1	..	..	1	..	..
S. P.	Oakland, Cal.†	Union	83	..	..	23†	..	..
Term. of St. L.	E. St. Louis, Ill.†	G.R.S.	117	..	13†	..	..	..

	Plants	Levers					
New	22	688	8	317	358	5	0
Rebuilt	12†	173†	2†	13†	158†	0†	0†
Grand Totals	34	861	10	330	516	5	0

† Rebuilt, levers added or new machine with complete rehabilitation of plant.

(1) Route interlocking in which a route is lined up by pushing two buttons, the figures as to number of levers is based on the number of buttons representing signals at entrances to routes, plus the number of levers that would have been required in a lever plant to control switch, crossover, slip switches, etc., plus the number of buttons used to control electric locks on hand-operated switches, crossovers or derrails.

(2) Table interlocker.

(3) Two crossovers added.

(4) Change in track layout and signals.

(5) Four home signals controlled by two desk levers.

(6) Track layouts revised, signals changed, and new control machine with miniature non-interlocked levers installed to replace previous electro-pneumatic type machine, the new machine also controlling several outlying layouts by code remote control.

(7) Style T-20 single-lever movement used to operate derrails on foreign road, and control signals on S. A. L., the movement being equipped with an electric lock controlled by approach circuits on the S. A. L.

773 track miles. The Santa Fe has been rapidly extending the application of a fourth aspect to existing automatic signals, and in certain instances respacing signals to correct braking distances. The Boston & Albany replaced semaphores with color-light signals on several short sections.

Interlocking Holds Its Own

Seven large interlockings, the majority of which were at large terminals, were completed during 1938, these plants including 629 of the total of 688 levers installed at the 22 new plants constructed. The largest plant completed during the year, including 138 working levers, is at the Los Angeles Union Terminal. On the tracks approaching the Los Angeles station, the Santa Fe made additions to its Mission Tower interlocking, installing a total of 106 additional levers. The Pennsylvania con-

solidated the control of several plants at Harrisburg, Pa., using a machine with 112 levers. Route-control interlocking, which was first introduced in the United States in 1937, with one plant on the New York Central, found ready acceptance in 1938 with the installation of four large plants. In this type of interlocking, a route is lined up merely by pushing two buttons, one representing the signal at which the train enters and a second button the point where the train departs. No levers, as such, for the control of individual units, are used, but in order to record these plants on an equivalent basis with lever plants, the units controlled, such as switches and signals, are totaled. On this basis, the route-control plant on the Baltimore & Ohio at Chicago includes 40 units, the one at the west end of the Bay Bridge at San Francisco 66 units, the one at Elizabethport, N. J., on the Central of New Jersey 78, and the one at Oakland, Cal., at the east end of the Bay Bridge 89 units.

In addition to the 22 new interlockings constructed during the past year, 12 plants were reconstructed, a total of 173 levers being added. At some of these plants, new interlocking machines, new signals, and some new switch machines were installed, together with complete new circuit arrangements including track-circuit locking, so that in effect the improvements represented practically new plants. Such a change was made by the Milwaukee at the Western Avenue plant in Chicago, where a new machine with 69 working levers was installed.

Protection at Outlying Crossings

At railroad crossings where the only routes normally used are for through moves across the track of the con-

Automatic Block Signals Completed During 1938

Railroad	Location	Miles of Road	No. of Signals	Manu- fac- turer
B. & M.	Reading, Mass.	..	(1) 1c	Union
C. N.	Nashua, N. H.	1.2s	(2) ..	..
G. T. W.	Grand Haven, Mich.	.6s	4c	G.R.S.
C. of N. J.	Elizabeth, N. J.	2.0d	6c	Union
C. & N. W.	Elizabeth, N. J.	3.0f	6c	Union
C. N. S. & M.	Chicago, Ill.	1.0f	(3) 11c	G.R.S.
C. R. I. & P.	Evanston, Ill., to North Chicago	23.85d	47c	Union
	Pratt, Kan., to Tucumcari, N. M.	339.1s	362c	Union
	Manly, Iowa, to Glenville, Minn.	19.8s	25c	Union
	Albert Lea, Minn., to Comus, Minn.	52.8s	63c	Union
L. & N.	Rosemount, Minn., to Inver Grove	10.5s	13c	Union
	Bowling Green, Ky., to Memphis Jct.	4.8d	4s	G.R.S.
	Elizabethtown, Ky.	.25d	2s	..
	East St. Louis, Ill.	.25d	2s	..
M. P.	Flinton, Ill., to Raddle	27.2s	(4) 13c	G.R.S.
	N. M.	1.7d	..	..
M. P. of Neb. Union, Neb., to Gilmore Jct.		24.6s	47c	G.R.S.
N. Y. C.				
P. & E.	Indianapolis, Ind.	1.6d	2c	G.R.S.
Pa.	Morrisville, Pa., to Dunlap	4.9d	3c	Union
	Columbia, Pa., to Midway	11.9s	15c	Union
U. P.		5.1d	..	..
	Los Angeles, Cal.	2.4d	9c	Union
Wabash	Bement, Ill., to Lodge	12.0d	8c	Union
	Gardnerville, Mo., to Foristell	25.0s	31c	Union
Totals		512.7 s 58.85d 4.0 f	8s 666c	
Grand Totals		575.55	674	

Legend:

In "Miles of Road" column: s = Single track, d = Double track, f = Four tracks.

In "Number of Signals" column: s = Semaphore, c = Color-light.

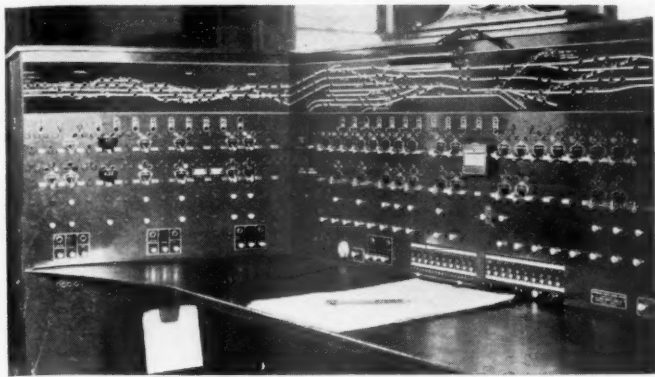
(1) Station protection signal.

(2) Rearrangement of signals on one track of double track.

(3) Four-track disc signals replaced with color-light.

(4) Automatic blocks in a C.T.C. installation.

flicting road, automatic interlocking is being used effectively, not only to replace manually-operated plants, but also to eliminate the need for train stops at crossings where no protection was formerly in service. During 1938, automatic interlockings were installed at only 6 locations, using 41 signals, as compared with 22 plants



The Machine Installed by the Pennsylvania at Columbia, Pa., Controls Five Outlying Plants in Addition to the One at Columbia

using 141 signals in the year previous. Where the traffic on one road is very light, and trains stop at stations near the crossings, a simple arrangement is being installed in which a single lever with an electric lock is being used to control the signals, and also derails if required. The Seaboard Air Line installed five such plants at crossings during 1938.

The installation of spring switches at 132 locations

tion practically equivalent to interlockings, were used on 20 of the spring switches installed last year.

Remote and Centralized Control

The installation of remote and centralized control continued at a good rate during 1938, including 246 levers controlling 129 power switches and 450 signals for directing train movements, as compared with 259 levers,

Automatic Interlockings Completed During 1938

Railroad	Location	No. of tracks		No. of Signals	Manufacturer
		on reporting road	on other road		
C. N.	Rouyn, Que.	..	..	6	...
C. & S.	Denver, Colo.	..	..	4	...
G. N.	Lennox, S. D.	1	1	8	...
	Bend, Ore.	1	1	8	...
N. Y. C. & St. L.	Celina, Ohio	1	1	9	...
U. P.	Clearfield, Utah	..	..	6	Union
Total plants 6.....				41	

143 switches and 438 signals in 1937. The two largest installations made were on the Pennsylvania, one at Thorndale, Pa., controlling six outlying layouts including the plant at Thorndale, and another at Columbia, Pa., controlling six layouts, including the plant at Columbia. The Missouri Pacific increased the capacity of 27 miles of single track between the ends of double track by installing C. T. C. between Flinton, Ill., and Raddle. The Texas & Pacific extended its previous installation on 32 miles of single track to facilitate train movements in congested territory between Texarkana, Tex., and Longview. The Boston & Albany installed C. T. C. on 6.9 miles of double track and 6.5 miles of three track line, using either-direction train operation on one track throughout as a means of increasing track capacity and reducing delays on grades between Webster Junction, Mass., and East Brookfield.

In 1938, car retarders were installed in the two classification yards of the Belt Railway of Chicago at Clearing, Ill., near Chicago. This project includes 95 power switches, and 44 retarders, totaling 3,308 rail feet of retarders.

Construction of Highway Crossing Protection Reduced

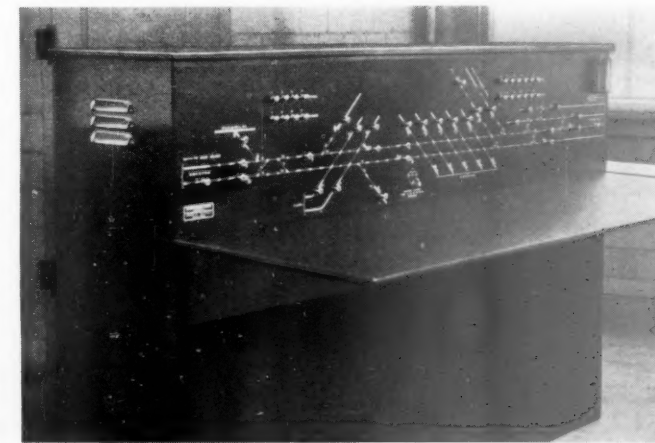
Automatically-controlled protection was installed at 897 railroad-highway crossings during 1938, as compared with 1,224 during 1937 and 1,071 in 1936. By the

Railroad	Classification as to Application				Signal Protection		
	Total No. of Spring Switches Installed	End of Passing Track	End of Double Track	Junction	Total No. Equipped with Facing Point Lock	High Signals	Dwarf Signals
A. T. & S. F.	28	27	..	..	1	..	..
C. P.	1	..	1	..	1	2	..
C. of N. J.	6*	..	..	..	6	..	..
C. & O.	7	..	..	..	3	6	7
C. & N. W.	..	..	..	..	1†	..	..
C. B. & O.	3	1	..	..	2	2	1
C. M. St. P. & P.	3	3	..	..	1	3	..
C. R. I. & P.	9	5	..	..	4	17	3
D. & H.	1	..	1	..	..	2	1
Erie	1†	..	1	..	1	2	..
F. E. C.	4	..	3	..	1	..	1
I. C.	1	..	1	..	..	1	..
L. & H. R.	1	..	..	..	1	..	..
L. & N.	7	..	1	3	3	10	1
Monongahela	1	..	1	..	1	2	1
N. Y. C.	1	..	1	..	..	1	..
Pac. Elec.	2	..	2	..	..	4	2
Pa.	..	..	..	..	..	..	..
L. I.	1	..	1	..	1	2	..
R. F. & P.	1	1	..	..	..	..	..
S. A. L.	4	1	..	..	4	2	..
Southern	1	2	..	..	..	..	..
A. G. S.	22	22	..	..	..	..	..
C. N. O. & T. P.	8	8	..	..	..	..	..
S. P.	5	1	2	1	1	2	7
T. & N. O.	3	..	1	..	2	..	..
T. & P.	2	2	..	..	..	2	..
U. P.	2	..	1	1	1	2	2
Virginian	6	6	..	..	..	6	..
W. P.	1	1	..	..	..	..	1
Totals	132	88	17	5	22	73	22

* Six 360° Fresnel red lights, lighting when switch is not fully normal.
† Existing spring switch equipped with facing-point lock.
‡ Temporary single track operation account construction work.

during 1938 was a decided reduction from the 406 installed during the previous year. Of the spring switches installed in 1938, 22 were at yard switches, 5 at junctions, 17 at ends of double track, and 88 at ends of sidings.

Mechanical facing-point locks, which afford protec-

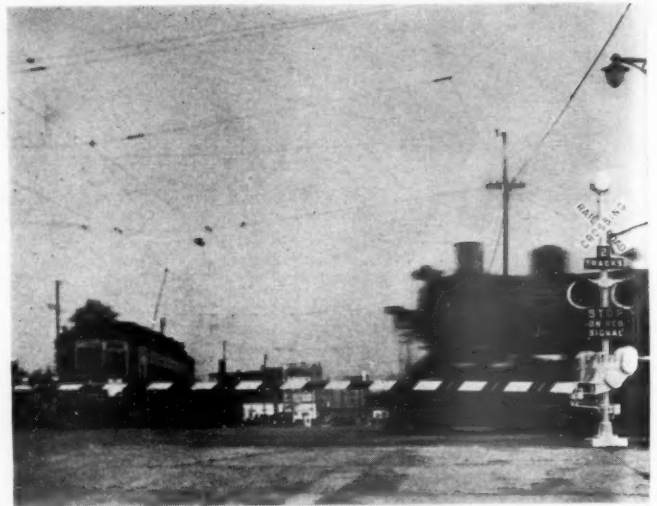


New Route-Control Interlocking on the Baltimore & Ohio Chicago Terminal

use of funds appropriated by the Federal government for this purpose, a considerable number of the states have carried to completion extensive crossing protection programs. Of the 897 installations made in 1938, a total of 501 were financed by federal funds, 70 by state funds, 306 by railroad funds, and 18 by county, city or private funds.

Of the 1,995 protective units installed at the 897 crossings, 252 were wig-wags, 1,352 flashing-light signals, 227 rotating-disk stop signals, 18 traffic-type stop-and-go signals, 138 power-operated gates, and 8 barriers. The Canadian railroads installed 95 wig-wags, the Norfolk & Western 25, the Southern Pacific 26, the Union Pacific 34, and the Pacific Electric 12. The Grand Trunk Western installed 10 traffic-type stop-and-go signals, and the New York & Long Branch installed 8 red stop lights at a crossing where manually-operated gates are in service.

The idea of using automatically-controlled "No Left Turn" or "No Right Turn" signals for protection on streets which are parallel and adjacent to tracks and intersect streets which cross the tracks, originated on the Reading several years ago, and is now being adopted by several roads for use as auxiliary protection. A total of 42 of these signals were installed in 1938. The number of power gates installed increased from 68 in 1937 to 138 for 1938, the Louisville & Nashville installing 47



Short-Arm Gates, Supplemented by Flashing-Light Signals, Were Installed on the Rock Island

Highway-Railroad Grade Crossing Protection Installed in 1938

Railroad	No. of Crossings	Sources of Funds			
		Railroad	Federal	State	City-County Private
A. C. & Y.	1	..	1	..	..
Alton	1	..	1	..	..
A. T. & S. F.	69	26	41	1	1
A. & W. P.	3	..	3	..	..
A. C. L.	14	..	14	..	..
B. & O.	16	12	4	..	..
B. & M.	18	15	3	..	..
C. N.	50	18.16	18.16	13.68	..
G. T. W.	11	4	2	2	3
C. P.	31	7.95	20.35	2.55	0.15
C. of Ga.	3	..	3	..	..
C. V.	1	1	..	..	..
C. & O.	9	3	6	..	..
C. & E. I.	7	2	5	..	..
C. & N. W.	43	6	37	..	..
C. B. & Q.	13	4	9	..	..
C. G. W.	3	..	3	..	..
C. I. & L.	9	3	6	..	..
C. M. St. P. & P.	44	18	26	..	..
C. R. I. & P.	15	6	9	..	..
C. St. P. M. & O.	2	1	1	..	..
C. S. S. & S. B.	1	..	1	..	..
D. & H.	2	1.50	..	0.50	..



Flashing-Light Signals Were Installed at 600 Crossings During 1938

Railroad	No. of Crossings	Sources of Funds			
		Railroad	Federal	State	City-County Private
D. L. & W.	2	1.50	..	0.50	..
D. & R. G. W.	4	4	..	..	..
D. T. & I.	1	0.50	..	..	0.50
D. S. S. & A.	3	..	3	..	..
E. J. & E.	3	..	3	..	..
Erie	6	5	1	..	..
F. E. C.	19	3	16	..	..
G. & F.	4	..	4	..	..
G. N.	16	2.33	12	1.33	0.34
G. B. & W.	10	..	10	..	..
G. M. & N.	9	..	9	..	..
I. C.	24	1	..	23	..
Ill. Term.	1	0.50	..	0.50	..
K. C. S.	1	1	..	..	..
K. & I. T.	1	1	..	..	..
L. & N. E.	1	0.50	..	0.50	..
L. V.	2	2	..	..	..
L. & N.	26	3	23	..	..
Me. C.	6	6	..	..	..
M. & St. L.	7	..	7	..	..
M. St. P. & S. S. M.	9	2	6	1	..
M. P.	17	10.50	6.50	..	..
Mo. Ill.	2	..	2	..	..
I-G. N.	1	1	..	..	..
M. & O.	7	0.50	..	6.50	..
N. C. & St. L.	3	..	3	..	..
N. Y. C.	28	11	13	4	..
C. C. C. & St. L.	21	9	11	1	..
I. H. B.	1	..	..	1	..
P. & E.	12	10	2	..	..
Rutland	4	..	4	..	..
N. Y. C. & St. L.	17	8	9	..	..
N. Y. N. H. & H.	11	11	..	..	..
N. Y. O. & W.	1	0.50	..	0.50	..
N. & W.	9	9	..	..	..
N. P.	1	1	..	..	..
Pac. Elec.	8	2	..	1	5
Pa.	56	34.55	19.45	1	1
L. I.	2	2	..	..	..
P. M.	17	3.90	11	2.10	..
P. & N.	1	..	1	..	..
Reading	11	1.50	9	0.50	..
N. Y. & L. B.	3	3	..	..	..
St. L.-S. F.	15	11	..	4	..
S. A. L.	41	..	41	..	..
Southern	8	6	2	..	..
C. N. O. & T. P.	3	3	..	..	..
S. P.	17	5.50	2	2	4.50 3¢
T. C.	1	..	1	..	..
U. P.	30	..	30	..	..
Wabash	8	..	8	..	..
W. M.	4	0.50	3	0.50	..
W. P.	2	..	2	..	..
W. & L. E.	11	..	11	..	..
Totals	897	306.39	501.46	70.66	15.49 3¢

of the new gates, the Canadian Pacific 12, and the New York Central 6.

This increased interest in the installation of automatic gates is a result of efforts to reduce the number of accidents, especially at crossings on multiple-track lines where "second train" accidents are prevalent. At such locations, at crossings already equipped with flashing-

light signals, short-arm gates, extending half-way across the paved section of the highway, are added as auxiliary protection. Barriers of the type that rise out of the level of the pavement were installed at two crossings on the Grand Trunk Western, and at one crossing each on the Akron, Canton & Youngstown and the Tennessee Central, while on the Boston & Maine an installation of these barriers operated by electric motors was replaced with a

Car Retarder Installations During 1938

Railroad	Location	No. of Class Tracks	No. of Towers	No. of Retarders	Rail Feet Retarders	No. of Power Switches	Manufacturer
Belt Ry. of Chicago	Clearing, Ill.	44 (EB)	3	24	1,760	51	Union
	Clearing, Ill.	36 (WB)	3	20	1,548	44	Union
Totals		80	6	44	3,308	95	

recently developed type using the electro-pneumatic system of operation.

Cab Signaling and Train Control

During 1938, the Pennsylvania placed in service its Paoli (Pa.)-Harrisburg electrification, including 315 road miles and 773 track miles, on which continuous

Table of Crossing Protection Installed in Different States, Separated As To Source of Funds and Units of Protection

State or Province	No. of Crossings	Sources of Funds				Total Protection Units
		Railroad	Federal	State	City-County Private†	
Ala.	5	..	5	..	..	13
Ariz.	4	3	1	..	..	5
Ark.	8	2	6	..	..	15
Calif.	28	9.50	1	4	10.50	49
					3†	
Colo.	18	3	15	..	..	33
Conn.	2	2	..	..	..	6
Del.	12	..	12	..	..	28
Fla.	36	3	33	..	..	65
Ga.	30	..	30	..	..	51
Idaho	2	1	..	..	..	3
Ill.	76	33.55	23.95	18	0.50	197
Ind.	108	29.50	75	3.50	..	274
Iowa	23	..	22	1	..	45
Kan.	32	23	8	1	..	63
Ky.	28	9	15	4	..	94
La.	1	1	..	..	..	2
Maine	6	6	..	..	..	15
Md.	4	1	3	..	..	10
Mass.	22	22	..	..	..	52
Mich.	54	10	35	5	4	127
Minn.	17	3	14	..	..	41
Miss.	9	..	4	5	..	20
Mo.	13	12	..	1	..	26
Neb.	7	..	7	..	..	16
Nev.	10	3	7	..	..	21
N. H.	1	..	1	..	..	2
N. J.	6	6	..	..	..	20
N. Y.	15	13	2	..	..	44
N. C.	13	..	13	..	..	23
Ohio	54	42	12	..	..	140
Okla.	2	..	1	1	..	4
Pa.	14	9	..	5	..	31
S. C.	13	..	13	..	..	26
S. D.	28	..	28	..	..	57
Tenn.	10	1	9	..	..	21
Tex.	40	4	36	..	..	84
Utah	5	1	4	..	..	9
Vt.	10	..	10	..	..	22
Va.	2	1	1	..	..	4
W. Va.	3	2	1	..	..	9
Wis.	45	23	19	3	..	93
Wyo.	3	..	3	..	..	6
Alta.	2	0.15	1.85	..	..	3
B. C.	2	0.66	0.33	0.67	0.34	3
N. B.	10	5.13	4.23	0.64	..	17
N. S.	13	4.33	4.33	4.34	..	13
Ont.	45	16.12	16.67	12.06	0.15	84
P. E. I.	1	0.33	0.33	0.34	..	1
Que.	5	1.12	2.77	1.11	..	8
Totals	897	306.39	501.46	70.66	15.49	1,995
					3†	

coded type cab signaling was installed as a part of the improvement. On the 8.5 miles of double-track line on the new San Francisco-Oakland Bay bridge and approaches, used by electrically-propelled interurban trains

Remote and Centralized Traffic Control Installations Completed in 1938

Railroad	Location	Miles of Road	Manufacturer	Direct wire or Coded Control	Deak Type	No. of Levers	C.T.C. Type	Power Operated Switches	No. of Signals Controlled
C. B. & Q.	Hastings, Neb.	3.16d	G.R.S.	CD	..	15	..	7	28
C. R. I. & P.	Manly, Iowa	0.3 s	Union	DW	2	..	..	..	6
	Glenville, Minn., to Albert Lea	10.4 s	Union	CD	..	16	..	5	40
	Inver Grove, Minn., to Newport	1.8 s	Union	DW	3	..	..	..	6
D. L. & W.	New Milford, Pa.	1.89d	Union	DW	4	..	..	2	6
E. B. T.	Oakland, Cal.	..	G.R.S.	DW	..	6	..	3	6
L. & N.	Memphis Jct., Ky., to Bowling Green	..	G.R.S.	CD	..	3	..	1	5
M. P.	Flinton, Ill., to Raddle	27.24s	G.R.S.	CD	..	39	..	23	75
	Bradford, Ark., to Bald Knob	1.66d	..	..	..	..	..	..	..
	..	9.4 s	G.R.S.	DW	..	9	..	3	16
	..	1.9 d	..	..	..	..	..	..	..
N. Y. C.	B. & A. Webster Jct., Mass., to East Brookfield	6.9 d	G.R.S.	CD	..	19	..	8	22
	..	6.5 t	..	..	..	..	..	..	..
N. Y. C. &	St. L. Brocton, N. Y.	1.0 s	Union	DW	2	..	..	1	5
N. & W.	Bonsach, Va.	..	Union	CD	..	3	..	1	6
	Devon, W. Va.	..	Union	CD	..	11	..	9	18
	Dorney, Ohio	..	Union	CD	..	2	..	1	4
Pa.	Morrisville, Pa.	0.09s	Union	DW	3	..	..	2	4
	Fallsington, Pa.	0.10s	Union	DW	3	..	..	2	4
	Morrisville, Pa.	0.17s	Union	DW	2	..	..	2	3
	Thorndale, Pa., to Dale	..	Union	CD	..	6	..	4	9
	Thorndale, Pa., to Glen	..	Union	CD	..	4	..	2	9
	Thorndale, Pa., to Downs	..	Union	CD	..	8	..	6	14
	Thorndale, Pa., to Caln	..	Union	CD	..	16	..	10	17
	Columbia, Pa., to Creswell	..	Union	CD	..	3	..	1	5
	Columbia, Pa., to Port	..	Union	CD	..	4	..	2	9
	Columbia, Pa., to Manor	..	Union	CD	..	4	..	3	7
	Columbia, Pa., to Lake	..	Union	CD	..	4	..	3	8
	Columbia, Pa., to Shocks	..	Union	CD	..	10	..	7	12
	Edgewood, Md., to Gunpow	..	Union	DW	4	..	..	2	6
St. L. S. W.	Tyler, Tex., to Lufkin	2.0 s	Union	CD	2	..	..	1	7
S. A. L.	Everett, Ga.	1.0 s	Union	DW	4	..	..	2	8
	Thalman, Ga.	1.0 s	Union	DW	2	..	..	1	4
T. & P.	Springdale, Tex., to Atlanta	8.8 s	G.R.S.	CD	..	8	..	4	20
	Marshall, Tex., to Longview	23.0 s	G.R.S.	CD	..	22	..	11	55
U. P.	Salt Lake City, Utah	..	Union	DW	3	..	..	..	6
		108.31				34	212	129	450
		86.3 s							
		15.51d							
		6.5 t							

Legend:

In "Miles of Road" column: s = Single track, d = Double track, t = Three tracks.

of the Key System and the Southern Pacific, a continuous coded system of automatic train control and cab signaling was installed without wayside automatic signals, a total of 331 coded track circuits being installed. On various roads, new locomotives and the power units of streamlined trains were equipped with locomotive apparatus for operation on existing train control or cab signal territories.

RAILROAD MEN have agreed, says the New York Times, that "postalization" of passenger fares would indeed send their corporations on the road to prosperity if this process could be accomplished under the same conditions that prevail in the Post-office Department. Thus, it was explained, if a passenger could be moved from New York to a place as adjacent as New Rochelle and be charged 3 cents for every ounce he weighed the transaction would be a profitable one to the interested railroad. Furthermore, if he would suffer himself to be placed in a bag, and in this condition thrown down chutes and flung into baggage cars, a substantial net saving over the present cost of carrying passengers would be achieved. Then, if he permitted himself to be thrown out of a train moving at fifty miles an hour or more and be stored in a warehouse below freezing point until morning, it might be expected that railroad prosperity was in plain sight. Given these conditions, the railroad managements believe they would show a good profit from the "postalization" of passenger fares.

T. & T. Construction Retarded

Level of activity dropped below 1937 in spite of extensive installations of carrier-current and printing-telegraph systems and high mileage of new copper wire

By E. J. Phillips

Associate Editor

ALTHOUGH construction in the railroad communication field slowed down considerably during 1938, substantial additions were made to existing outside and inside plant. The general level of activity, while lower than in 1937, remained higher than in 1936 and considerably above the 1930-1935 level. A comparatively large mileage of pole line was constructed or rebuilt, while extensive mileages of carrier-current and printing-telegraph systems were installed. New long-distance telephone circuit mileage showed a substantial increase over 1937, while the installation of new telegraph circuits remained at a level considerably above the 1930-1935 average. Due primarily to a single large construction project, the mileage of new copper wire installed was exceptionally high.

However, the principal increases in communication plant facilities given in Table A for 115 railroads in the United States and Canada for the year 1938 show a substantial drop from the 1937 level. These figures indicate

Table A—Principal Increases in Communication Plant Facilities in the United States and Canada During 1938, as Compared with 1937

Miles of new or rebuilt pole line:	1938	1937
Railroad owned	1,933	2,932
Commercially owned	3,554	2,817
Jointly owned	1,219	2,427
Total	6,706	8,176
Miles of new copper wire:		
Railroad owned	32,837	9,275
Commercially owned	2,144	4,329
Total	34,981	13,604
Gross increase in miles of road dispatched by telephone	670	1,094
Increase in miles of long distance telephone circuits ..	10,166	6,946
New mileage of telegraph circuits, all types	10,561	13,668
Increase in miles of printing telegraph circuits	4,007	6,683
Number of new printing telegraph machines	71	109
Increase in miles of new carrier-current systems	2,711	6,105

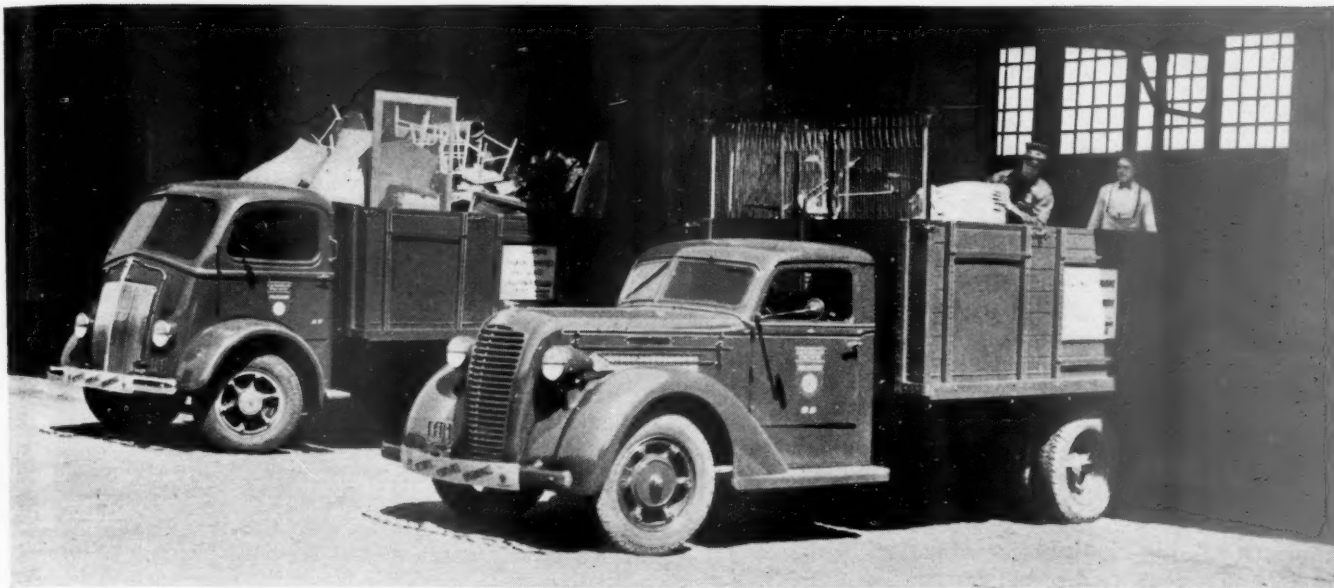
that 18 per cent less mileage of pole line was installed or rebuilt in 1938 than in 1937; that new mileage of telegraph circuits of all types was 23 per cent less; that 40 per cent less mileage of printing telegraph circuit was installed; that 39 per cent less new mileage of road was equipped for telephone train dispatching; and that the installation of carrier-current systems lagged behind 1937



by 56 per cent on a mileage basis. However, the quantity of new copper wire provided in 1938 exceeded the 1937 figure by 157 per cent, while the new mileage of long-distance telephone circuits was 46 per cent greater.

A total of 6,706 miles of pole line was constructed new in 1938 or rebuilt, as compared with 8,176 miles in 1937. Less activity was indicated in this phase of the work on railroad- and jointly-owned pole lines than on commercially-owned lines. Comparatively long mileages of new or rebuilt railroad-owned pole lines were reported by the Louisville & Nashville with 906 miles, by the Pennsylvania with 293 miles, by the Chesapeake & Ohio with 170 miles, and by the Nashville, Chattanooga & St. Louis with 151 miles. The figures for commercially-owned lines include 544 miles reported by the Missouri Pacific system, 469 miles by the Seaboard Air Line, 399 miles by the Chicago, Rock Island & Pacific, 353 miles by the St. Louis-San Francisco, 250 miles by the Central of Georgia, and 237 miles by the New York, New Haven & Hartford. Of the 1,219 miles of new or rebuilt jointly-owned pole lines, the Atchison, Topeka & Santa Fe reported 602 miles, and the Union Pacific system 243 miles.

The application of new telegraph circuits of all types continued at a rapid pace, 10,561 miles having been
(Continued on page 96)



Modern Co-Ordinated Highway Service Brings Merchandise Back to the Freighthouses

Railway Motor Transport Marches On

Co-ordinated operations are being continuously expanded to give shippers more flexible service

By Charles Layng

Motor Transport Editor

DESPITE several adverse decisions by the Interstate Commerce Commission and interference from various other regulatory bodies, motor transport as an adjunct to railway operations continued to expand during 1938. The trend toward direct ownership and operation of highway equipment, which has been marked for the last few years, continued to make itself felt in 1938, and, in general, the railways also continued to exercise greater control over the operations and purchase of equipment by trucking companies under contract with them for hauling railway freight. Several thousand such contracts are in existence and the cumulative effect has been to put the railways into the motor transport business more largely and directly than ever before.

Doings of the I. C. C.

Even those railways not directly owning and operating highway subsidiaries have now almost completely replaced the former slow and cumbersome trap-car system of interchange between stations at large terminals for the faster and more flexible motor truck handling of such interchange freight. A further feature of the year was the success experienced by such large trucking interests as the railway-owned Railway Express Agency, and the Columbia Terminals Company (closely affiliated with

the railways for many years) in handling collection and delivery, interchange and intercity trucking services for the railways.

The policy of the Interstate Commerce Commission with regard to rail-highway co-ordination has been rather difficult to follow during the year, as it has seemed to be lacking in consistency. Commissioner Eastman has been fairly consistent in endeavoring to promote the rail-highway co-ordination he urged so insistently when he was federal co-ordinator, but his success in getting other commissioners to see eye to eye with him in this respect has not been particularly marked. Contrary to the report of its examiner, the commission turned down the application of the Union Pacific, the Chicago & North Western and the Chicago, Burlington & Quincy to buy the Union Transfer Company, a large trucker out of Omaha, Neb. This case was decided adversely after two years of deliberation and may well serve as an important precedent in future cases where several railways jointly wish to purchase a truck line.

Difficult to comprehend, also, has been the steadily rising opposition of railway labor to the operation of truck lines by the railways, for the improved service brought about by rail-highway service has in almost every instance, notably on the Southern Pacific and Texas & Pacific, brought traffic back to the rails that

would otherwise have moved entirely by truck; which has created more train miles, and brought about increased employment of train and engine crews and station forces.

Considerable progress has been made by the Motor Carrier Bureau of the I. C. C. in stabilizing operating conditions in the trucking industry and promoting the safety of truck operations. It is worthy of note, in this connection, that railway-owned and operated truck and bus fleets have established remarkable safety records and carried off many prizes for safe highway operations. This has been accomplished by applying to the operation of vehicles over the highway the same principles that have made possible the outstanding safety record of the railways elsewhere.

Expanding Truck Operations

Early in December, after much deliberation, the I. C. C. finally approved the request of the Kansas City Southern for rail-highway co-ordination, within certain limitations. Despite these limitations, the K. C. S. plans to establish a completely co-ordinated system over its entire railroad for the handling of merchandise traffic by rail and truck.

The year also witnessed the completion of the formation of a highway subsidiary of the Chicago, Rock Island & Pacific, which, from nothing at all in 1937, has now built up a fleet of 130 highway units in freight service for the Rock Island Motor Transit Company, all of which have been purchased new or rehabilitated in the Rock Island's new automotive shop at Des Moines, Iowa. The operations of the transit company are at present largely independent of the railway, but they are being co-ordinated as rapidly as possible to provide the type of fast, convenient service which it is expected will bring more merchandise freight back to the railway.

The St. Louis-San Francisco also began operations of a new highway subsidiary during the year. Existing rail-highway subsidiaries throughout the country increased their truck fleets as their operations continued to expand, while several short lines established small but effective highway subsidiaries, ranging from three or four trucks each to operations of the size conducted by the East Tennessee & Western North Carolina. This line operates a narrow gage railway, 34 miles in length, in the Tennessee and North Carolina mountains, and owns a fleet of 85 highway trucks, whose operations range over a considerably larger territory.

The end of the year will witness the successful completion of the largest rail-highway operation ever attempted—the hauling of cement and other construction materials by the Southern Pacific to the new Colorado river aqueduct in Southern California. This gigantic task involved the handling of thousands of carloads of materials to certain railhead distribution points and from there to the aqueduct by trucks. Without the services of the trucks, the railway would have secured little or none of this business, which has been moving constantly over a period of four years.

Various special forms of rail-highway co-ordination,

such as delivering automobiles from railway platforms to the selling floor by truck, and the handling of highway trailers between certain points on flat cars, have also been continued, and, in some cases, expanded during the year.

Bus Developments

The outstanding passenger rail-highway co-ordination begun during the year was the establishment on July 1, after protracted litigation, of combined bus-streamlined train service between San Francisco and Los Angeles by the Atchison, Topeka & Santa Fe. This road, because of its circuitous rail route, had offered no through service between the points named since 1917. The co-ordination of trains and buses, the latter using the short, high-speed highway between Los Angeles, Calif., and Bakersfield, permitted a fast, convenient service to be established which is competing successfully with the other transportation agencies serving the two points. As a further inducement, a rate of 1.5 cents per mile is offered on the bus-train service between these points. This railway has also established a train connection bus service this year across the Bay bridge, thus eliminating the use of ferryboats between Oakland and San Francisco. This operation is similar to that of the Baltimore & Ohio between Jersey City and New York, and the Union Pacific between East Los Angeles and various points in the Los Angeles district.

From a mechanical standpoint, the outstanding bus development of the year was the first large scale air conditioning of buses. The Interstate Transit Lines (U.P.-C. & N. W.), the Santa Fe, and the Greyhound Lines all developed large fleets of air-conditioned equipment during the year and indications are that air-conditioned passenger equipment will soon be as commonplace on the highways as it is now on the rails.

A further development was the installation, on certain experimental runs, of so-called "luxury" coaches. These units seat fewer passengers than the standard bus, giving each individual passenger more room. Meals are served en route by stewardesses in attendance; the buses are provided with washrooms, and it is expected that much faster schedules can be maintained on limited, extra-fare runs through the elimination of rest and meal stops.

The appended list of orders for highway vehicles shows that during 1938 the railroads and reporting subsidiaries placed orders for a total of 260 motor coaches, 1,647 units of highway freight equipment, and 164 automobiles. This compares with 771 motor coaches, 1,692 units of freight equipment, and 198 automobiles reported as purchased during 1937. The list of orders, which has been compiled from questionnaire-reports from the railroads and their reporting subsidiaries, is presented with the purpose of indicating the possibilities in, and the trend of, the railroad market for automotive equipment, and no brief is held for its completeness. It should be noted furthermore that the list does not include substantial replacements and additions to the truck fleets of the many contract carriers which perform collection and delivery and local freight services for the railroads.

Orders for Highway Vehicles

Purchaser	No.	Type of vehicle	Seating capacity or truck capacity in tons	Where to be used	Manufacturer
Alabama, Tennessee & Northern	1	Automobile	5	Co. Business	Chrysler
Alton & Southern	1	Automobile	.....	Co. Business	Chrysler
	1	Automobile	.....	Co. Business	Ford
	1	Automobile	.....	Co. Business	Chevrolet

Purchaser	No.	Type of vehicle	Seating capacity or truck capacity in tons	Where to be used	Manufacturer
Atchison, Topeka & Santa Fe					
Santa Fe Trail Transportation Co.	13	Bus	36	Rev.	A. C. F. Motors
	6	Bus	25	Rev.	Flxible
	1	Truck	1½ ton	Rev.	General Motors
	1	Truck	2 ton	Rev.	Dart
	3	Automobile		Co. Business	Chrysler
	1	Automobile		Co. Business	Chevrolet
Santa Fe Trails of Illinois, Inc.	10	Bus	35	Rev.	A. C. F. Motors
Southern Kansas Greyhound Lines, Inc.	2	Bus	36	Rev.	A. C. F. Motors
	1	Bus	25	Rev.	Flxible
	1	Bus	7	Rev.	Chrysler
Baltimore & Ohio	6	Bus	29	Rev.	White
Bangor & Aroostook					
Bangor & Aroostook Transportation Co.	1	Bus	21	Rev.	General Motors
Boston & Maine	2	Truck	1½ ton	Co. Business	
	1	Truck	2½ ton	Co. Business	
	4	Automobile	2	Co. Business	
	1	Automobile	5	Co. Business	
Boston & Maine Transportation Co.	5	Bus	37	Rev.	
	3	Bus	21	Rev.	
	1	Bus	32	Rev.	
Chesapeake & Ohio	1	Automobile	5	Co. Business	General Motors
Chicago & Western Indiana	1	Truck	1½ ton	Co. Business	Int. Harvester
Chicago, Burlington & Quincy	1	Automobile	5	Co. Business	Plymouth
	1	Automobile	5	Co. Business	Chevrolet
Burlington Transportation Co.	6	Truck	1½ ton	Rev.	Chevrolet
	5	Tractor	3 ton	Rev.	Int. Harvester
	2	Tractor	1½ ton	Rev.	Chevrolet
Chicago, Milwaukee, St. Paul & Pacific	6	Trailer	10 ton	Rev.	Fruehauf
	1	Tractor	1½ ton		
	2	Trailer			
	8	Automobile			
Chicago, St. Paul, Minneapolis & Omaha	1	Trailer	10 ton	Rev.	Wilson Body Co.
Chicago, South Shore & South Bend	1	Bus	21	Rev.	Studebaker-Fitzjohn
	2	Truck	1½ ton	Co. Business	Int. Harvester
	1	Truck	¾ ton	Co. Business	Int. Harvester
	1	Automobile	2	Co. Business	Ford
Colorado & Southern					
Denver & Interurban Motor Co.	1	Bus	37	Rev.	White
Copper Range					
Copper Range Motor Bus Co.	1	Bus	22	Rev.	Studebaker
Cumberland & Pennsylvania	1	Automobile	4	Co. Business	Chevrolet
Delaware, Lackawanna & Western	1	Truck	1½ ton	Co. Business	Ford
Detroit, Toledo & Ironton	10	Automobile	5	Co. Business	Ford
Erie	4	Truck	½ ton	Co. Business	Chevrolet
	3	Truck	1½ ton	Co. Business	Chevrolet
	2	Truck	1½ ton	Co. Business	General Motors
	2	Truck	½ ton	Co. Business	Ford
	7	Automobile	5	Co. Business	Plymouth
	5	Automobile	5	Co. Business	Chevrolet
	4	Automobile	5	Co. Business	Chevrolet
	4	Automobile	2	Co. Business	Ford
	2	Automobile		Co. Business	Ford
Florida East Coast	1	Truck	1½ ton	Co. Business	General Motors
Fonda, Johnstown & Gloversville	6	Bus	35	Rev.	General Motors
	4	Bus	21	Rev.	General Motors
	2	Bus	32	Rev.	General Motors
Gulf, Mobile & Northern					
Gulf Transport Co.	1	Bus	24	Rev.	Fitzjohn Body Co.
	1	Bus	25	Rev.	Flxible
Lehigh Valley	15	Truck	1½-3 ton	Co. Business	
	6	Automobile	5	Co. Business	
Maine Central					
Maine Central Transportation Co.	4	Bus	37	Rev.	
Minneapolis & St. Louis	1	Truck	1½ ton	Co. Business	Chevrolet
Missouri & Arkansas	1	Automobile	5	Co. Business	Pontiac
	1	Automobile	5	Co. Business	Ford
Missouri-Kansas-Texas	2	Bus	22	Co. Business	Chevrolet
Missouri Pacific	12	Automobile	5	Co. Business	Chevrolet
	5	Automobile	5	Co. Business	Plymouth
	3	Automobile	5	Co. Business	Ford
New York Central System	1	Truck	½ ton	Co. Business	Dodge
	1	Truck	2 ton	Co. Business	General Motors
	1	Truck	2½ ton	Co. Business	General Motors
Central Greyhound Lines, Inc.	23	Truck	1-2½ ton	Co. Business	Int. Harvester
	12	Bus	36	Rev.	General Motors
	3	Bus	25	Rev.	Flxible
	1	Bus	40	Rev.	White
New York, Chicago & St. Louis	1	Truck	1½ ton	Co. Business	Chevrolet
	1	Truck	1 ton	Co. Business	Ford
New York, New Haven & Hartford	4	Truck	3 ton	Co. Business	Ford
	2	Truck	1½ ton	Co. Business	Ford
	1	Truck	1 ton	Co. Business	Ford
	4	Automobile	2	Co. Business	Ford
	1	Automobile	5	Co. Business	Ford
	1	Automobile	5	Co. Business	Hudson
New England Transportation Co.	10	Tractor	10 ton	Rev.	General Motors
	5	Tractor	8 ton	Rev.	General Motors
	5	Trailer	8 ton	Rev.	General Motors
	5	Trailer	10 ton	Rev.	General Motors
	2	Automobile	5	Co. Business	Plymouth
Connecticut Company	9	Bus	38	Rev.	General Motors
	2	Bus	25	Rev.	General Motors
	2	Bus	40	Rev.	Ford
	2	Bus	37	Rev.	Mack
	1	Bus	35	Rev.	Mack
	1	Truck	8 ton	Co. Business	Int. Harvester
Bershire Street Railway	2	Automobile	5	Co. Business	Ford
Springfield Street Railway	1	Bus	40	Rev.	Ford
	7	Bus	25	Rev.	General Motors
	5	Bus	30	Rev.	Mack
	3	Bus	21	Rev.	General Motors
	1	Truck	3 ton	Co. Business	Ford
Norfolk & Western	2	Automobile	2	Co. Business	Ford
Norfolk Southern	1	Truck	1½ ton	Co. Business	Dodge
Norfolk Southern Bus Corporation	2	Bus	37	Rev.	General Motors
Northern Pacific	1	Truck	¾ ton	Rev.	Chevrolet
	1	Trailer	1 ton	Rev.	Blue Front Body Works
	1	Automobile	5	Co. Business	Chevrolet
Northern Pacific Transport Co.	1	Truck	7 ton	Rev.	Kenworth
	1	Trailer	3 ton	Rev.	Kenworth
	1	Automobile	5	Co. Business	Ford
Yellowstone Park Company	14	Bus	14	Rev.	White
	2	Automobile	7	Rev.	Buick
	1	Truck	1 ton	Co. Business	Ford

Purchaser	No.	Type of vehicle	Seating capacity or truck capacity in tons	Where to be used	Manufacturer
Pennsylvania					
Pennsylvania Trucking Affiliates	38	Truck	Less than 3 ton	Rev.	
	4	Truck	3-5 ton	Rev.	
	2	Tractor	5-10 ton	Rev.	
Peoria & Pekin Union	7	Automobile		Co. Business	Ford
Pere Marquette	1	Truck	1½ ton	Co. Business	Ford
Portland Terminal Co.	1	Truck	1½ ton	Co. Business	
Railway Express Agency	1328	Truck	Light		
	44	Tractor			
	84	Trailer			
	27	Automobile			
St. Louis Southwestern					
Southwestern Transportation Co.	8	Truck	1½ ton	Rev.	Chevrolet
	6	Truck	2 ton	Rev.	White
	5	Truck	1½ ton	Rev.	Ford
	4	Truck	1½ ton	Rev.	Dodge
	2	Truck	1½ ton	Rev.	General Motors
	2	Truck	1½ ton	Rev.	Int. Harvester
	1	Automobile		Co. Business	Chevrolet
	1	Automobile		Co. Business	Ford
Southwestern Greyhound Lines, Inc.	20	Bus	36	Rev.	General Motors
Seaboard Air Line	1	Truck	1½ ton	Rev.	Int. Harvester
	2	Tractor	1½ ton	Rev.	Int. Harvester
	2	Trailer	5 ton	Rev.	Trailer Co. of America
	6	Automobile		Co. Business	Chevrolet
	3	Automobile		Co. Business	Plymouth
	1	Automobile		Co. Business	Ford
Southern Pacific	1	Truck	Light	Co. Business	
	3	Automobile	2	Co. Business	
	2	Automobile	5	Co. Business	
Pacific Motor Trucking Co.	2	Truck	2½ ton	Rev.	
	1	Truck	3½ ton	Rev.	
Pacific Greyhound Lines	80	Bus	37	Rev.	General Motors
	5	Automobile	5	Co. Business	Chevrolet
	1	Automobile	5	Co. Business	Plymouth
Tennessee Central	1	Automobile	2	Co. Business	Chevrolet
Texas & New Orleans	1	Automobile	5	Co. Business	Chevrolet
Toledo Terminal	2	Automobile	5		Chrysler
Union Pacific					
Utah Parks Co.	1	Bus	10	Rev.	White
Utah	1	Bus	8	Co. Business	Chevrolet
Waterloo, Cedar Falls & Northern	1	Automobile		Co. Business	Oldsmobile
Western Maryland	1	Truck	1½ ton	Co. Business	Dodge
	1	Truck	1½ ton	Co. Business	Mack

Canada

British Columbia Electric Railway	1	Bus	35	Rev.	Hayes-Leyland
National Harbours Board	1	Truck	1½ ton		Ford
	1	Truck	2 ton		General Motors

T. & T. Construction

(Continued from page 92)

placed in service during 1938 as compared with 13,668 miles in 1937, and 966 miles in 1936. Of the 1938 mileage, the Union Pacific system reported 118 miles, the Chicago, Rock Island & Pacific 386 miles, and the Canadian Pacific 10,036 miles.

Telephone dispatching circuits were installed on 230 miles of road by the Bangor & Aroostook, while the

31,175 miles railroad-owned was reported by the Pennsylvania system and included cable used on the electrification project as follows: 18.5 miles, 96 pr.; 83.2

Table C—Principal Printing Telegraph Installations Completed in the United States and Canada During 1938

	Miles of Circuit	Number of Machines
Atchison, Topeka & Santa Fe	486	8
Chicago, Milwaukee, St. Paul & Pacific	421	3
Chicago, Rock Island & Pacific	414	10*
Missouri Pacific (System)	447	7
Pennsylvania (System)	1,551	27
Southern (System)	464	3

* Also 16 reperforators

Table B—Principal Copper Wire Installations Completed in the United States and Canada During 1938

	Miles of New Copper Wire—		
	Railroad Owned	Commercially Owned	Total
Atchison, Topeka & Santa Fe	502	...	502
Bangor & Aroostook	...	440	440
Canadian National	33	984	1,017
Canadian Pacific	5	399	404
Missouri Pacific (System)	379	...	379
Pennsylvania (System)	31,175	16	31,191
Western Maryland	224	...	224

Southern simplex existing telegraph wires to obtain 93 miles. The Denver & Rio Grande Western equipped 200 miles with telephone dispatching by transposing two No. 9 iron wires previously used as telegraph circuits between Alamosa, Colo., and Durango, with the installation of intermediate repeaters at Chama, N. M., and a terminal repeater at Durango.

One of the most extensive communication plant projects completed during 1938 was made by the Pennsylvania in conjunction with its electrification program in the Philadelphia-Harrisburg area, where the open-wire communication lines were placed in aerial cable under gas pressure for a distance of approximately 300 miles. Of the total of 34,981 miles of new copper wire,

31,175 miles railroad-owned was reported by the Pennsylvania system and included cable used on the electrification project as follows: 18.5 miles, 96 pr.; 83.2 miles, 74 pr.; 51 miles, 54 pr.; 113.8 miles, 38 pr.; 20.3 miles, 24 pr.; and 5.3 miles, 14 pr. Other roads reporting comparatively large mileages of new copper wire are listed in Table B.

The increase of 10,166 miles of long-distance telephone circuits was accounted for, in major part, by 6,510 miles reported by the Pennsylvania system in connection with the Philadelphia-Harrisburg electrification program. The Canadian Pacific reported 1,969 miles, the St. Louis-San Francisco 305 miles, the Colorado & Southern 241 miles, and the Bangor & Aroostook 230 miles.

Principal installations of printing telegraph circuits and machines made in 1938 are listed in Table C.

Carrier-current systems showed an increase of 2,711 miles. The application of carrier systems was reported by six roads, the Canadian Pacific installing 695 miles, the Southern 637 miles, the Chesapeake & Ohio 494 miles, the Chicago, Rock Island & Pacific 386 miles, the St. Louis-San Francisco 305 miles, and the Missouri Pacific 194 miles.

NEWS

Well-Directed Campaign Will Cure Railroads' Ills

Such is I. C. C. advice as it warns in annual report that problem will not be solved "out of hand like a cross-word puzzle"

The country's railroad problem will not be solved "out of hand like a problem in geometry or a cross-word puzzle," but it will succumb to a "well-directed, well-organized and continuing campaign," according to the view expressed by the Interstate Commerce Commission as it undertakes in its fifty-second annual report to indicate "the opportunities which exist for improvement and what must be done if these opportunities are to be utilized." The report, which was submitted to Congress on January 3, devotes the first 25 of its 123 pages to a discussion of the railroad problem, ("the more accurate term is 'transportation problem'") including a defense of the commission's regulatory activities. Such discussion is followed by an explanation of the commission's status, wherein comes a denial that the present set-up makes the I. C. C. an "irresponsible" body.

LEGISLATIVE RECOMMENDATIONS

There are, however, no recommendations for legislation dealing with the rehabilitation of transportation agencies; the commission anticipates in that connection that "various proposals" will be presented to congress, and thus "opportunity will be afforded for thorough consideration of the general subject." Except for two minor ones, the specific legislative recommendations are carry-overs from last year's report of matters upon which congress failed to act. The recommendations are as follows:

1. That non-carrier railroad subsidiaries be brought within I. C. C. jurisdiction, at least as to their accounting and issuance of securities, and that restrictions be imposed on the expenditure of carrier funds, incurring obligations, or acquiring property by a carrier or its subsidiaries, except for the operation or legitimate improvement of its property.

2. That section 15 (1) and (3) of Part I of the Interstate Commerce Act be amended "so as to enable us to prescribe minimum as well as maximum joint rail-water rates."

3. That section 15(4) of Part I be amended to permit the establishment of

through routes regardless of the "short-hauling" of any carrier.

4. That congress legislate to cover completely the standard time zone field.

5. That section 20 be amended to strengthen the commission's power to require answers to questions upon which it may need information.

6. That provision of law be made for imposing a "reasonable fee" for admission to practice before the commission.

7. That provision of law be made so that members of state regulatory bodies, when participating cooperatively with the commission in proceedings under Part I shall receive the same expense allowances as are now provided with respect to similar participation in proceedings under Part II, the Motor Carrier Act.

Nos. 6 and 7 are the two recommendations which did not appear in last year's report. Meanwhile throughout the report the commission has expressed its opposition to changes in the Interstate Commerce Act which have been agitated by others. In this connection it makes caustic reference in a footnote to railroad proposals for changes in section 15a "for the purpose of limiting our discretion in passing upon rate increases, so that upon proof of low earnings approval of such increases would necessarily follow." The footnote goes on to say that the commission does not favor such an amendment, adding, however, that "the simple way to accomplish the real result desired would be to limit our authority to the fixing of minimum rates and the removal of unjust discrimination (using the term in the broad sense), leaving maximum rates to the discretion of the railroads." If such were done the commission ventures to believe that the railroads "would make limited use of the freedom so accorded—it is one thing to increase rates where government, through this commission, shares the responsibility, and it is quite another thing for the managements, under competitive conditions, to accept sole responsibility."

Neither does the commission favor giving the railroads a free hand on consolidations; it does not believe that "there is

anything in their record which at all warrants a conclusion" that they "can be depended upon to do what should be done wholly on their own initiative." Also, the report asserts at another point, "there is gross exaggeration to the idea that every act of the railroads is subject to regulation;" it goes on to say that the carriers have "a large degree of initiative" in rate-making, and to cite the commission's limited power over freight services and lack of power over passenger services. Likewise cited is the carriers' freedom with respect to the selection and-pay of officers, the purchase of equipment and supplies, operation of shops, maintenance of tracks, erection of stations or other buildings, awarding of construction contracts, and the management of affairs "in many other ways." All in all the commission thinks the pattern of railroad regulation "is in no way unique, but is substantially the same as is now applied generally throughout the country by the states or the federal government to other public utility companies." And the Motor Carrier Act and the Civil Aeronautics Act have provided for motor carriers and air lines, respectively, "a system of regulation which is, if anything, more comprehensive than that which has been provided for the railroads."

The commission does, however, favor repeal of land-grant rates and liberal government loans for equipment and other facilities, in which connection it recalls the recommendation of the Splawn-Eastman-Mahaffie committee that \$300,000,000 be made available. "Under existing conditions," the report says, "the use of government credit for such a purpose...is both defensible and desirable."

CAUSES OF RAILROAD PROBLEMS

Launching its 25-page discussion of "The Railroad Problem" the commission notes how that problem became "increasingly acute" during the year under review; and how there have been "insistent demands" that the government "solve" it. But "while all manner of solutions have been proposed, public opinion has not as yet concentrated upon any course of action." The problem, the report next points out, is "the product of railroad poverty," and it emerged in its present phase "with the beginning of the general economic depression about eight years ago." Meanwhile the problem is "not peculiar to our own time or our own land;" but here the background is that "the railroad industry has been one of our greatest institutions," and those who put their faith in it, including both investors and employees, "are disheartened." Also, "the curtailment of railroad purchases has been one of the important factors tending

to intensify and prolong general industrial depression."

Dealing with "The Causes" the report finds it clear that "railroad ills have been precipitated by an abrupt and continued decline in demand for railroad services, unparalleled in severity and duration." It further finds that the depression was the "primary" cause of this fall in demand; but increased competition "contributed heavily" to the situation. Another adverse influence has been "a tendency toward the decentralization or spreading of industrial operations." In statistics cited this plight of the railroads "is strikingly illustrated;" in 1936 the rail carriers handled "somewhat less freight traffic and much less passenger traffic than in 1916, although in the 20 intervening years the investment in their properties had increased by more than eight billions of dollars."

CONTRIBUTORY FACTORS

"The chief contributory factor to railroad distress, as distinguished from primary cause," the report goes on, "has been the great volume of indebtedness." A footnote here explains that the "large amount of railroad debt and fixed charges is not the same thing as 'over-capitalization'". It continues to point out that railroads are not over-capitalized on the basis of the cost of their properties or on the basis of value—but only on the basis of earning power, assuming the "apparent estimate of that in the present stock and bond market to be correct." However, the footnote adds, "this has not always been so, and such estimates fluctuate continually and rapidly with changing conditions." Nevertheless, after this explanation, the report notes that "in view of the relatively large volume of their indebtedness, many railroads have been driven into receivership or bankruptcy, and many more have curtailed expenditures drastically, often to the detriment of their properties, to escape such proceedings." This has been "the most demoralizing feature of present railroad ills, and the one that has particularly attracted the attention of the country."

Among other factors contributing to railroad distress, the commission lists "financial exploitation of the past;" the "failure of the managements for some time to appreciate the danger impending from the competition of other forms of transportation, and to adjust services and rules to forestall or meet it;" the fact that lack of credit has precluded modernization of equipment to the extent desirable; the construction of "expensive passenger stations, such as those in Cleveland and Cincinnati;" and the "underlying fact that many railroad lines in the past were improvidently planned and projected, and some of them should never have been built." Finally, "the coincidence of an increase of about eight per cent in railroad wages in the latter part of 1937 with an unanticipated precipitate fall in traffic aggravated and magnified the unfavorable financial results of that fall."

Among the "all manner of remedies" which have been suggested the commission finds many which may be classified as "nostrums," but others are "worthy of attention." The trouble with most of them, it adds, is "that they are the product of

limited information and a certain predisposition of opinion." Going to work on the suggested "solutions," the report first considers the idea of "less regulation," the thought having been "fostered by the railroads and accepted by many investors that regulation has been carried beyond proper bounds." Noting that the "chief complaint" in this connection addresses itself to rate-making, the commission leaves it to others "to pass judgment" while it merely recounts "certain facts."

POST-1920 RATE-MAKING

There follows a review of rate-increase movements since 1920, beginning with the "unprecedented increases in rates and fares" allowed in that year "on top of the already heavy increases which had been made during federal control." Almost immediately there came a business depression and the railroads themselves began to reduce many rates, while in 1921 industry "with practically one voice" asked a general reduction on the ground that the existing rates were "stifling trade." In 1922 the commission reduced the increased rates by 10 per cent wherever they had not been voluntarily reduced by that much or more; but it refused to reduce passenger fares, and "it is now generally agreed that the managements were guilty of a grave error in judgment in maintaining these high fares for more than a decade thereafter in the face of continually falling passenger traffic."

After 1922, the report goes on, "no general increase in railroad rates was sought until 1931," although an application of Western roads for a horizontal increase of five per cent was denied, "but only on the ground that an indiscriminate increase in all rates had not been justified in view of the manifest need for a discriminating readjustment of the rate structure." To the charge that it meanwhile "whittled down" many individual rates, the commission answers that it "as often sanctioned increases as required reductions"; while during that period "the railroads in general prospered, and very liberal expenditures for maintenance on the part of many were impelled by the threat of the recapture clause of the Transportation Act, 1920, which clause has since been repealed."

Discussing its action in post-1931 rate-increase movements which culminated in the Ex Parte 123 case, the commission said that it did not in such proceedings "attempt to compensate for the abnormal drop in traffic, but did undertake to compensate for what appeared to be permanent increases in expenses." Meanwhile it did not order Eastern roads to cut fares until the "success" of Western and Southern experiments with lower passenger rates "had been demonstrated;" and in July, 1938, it permitted Eastern roads to increase coach fares from two cents per mile to 2.5 cents for an experimental period of 18 months, "with results which so far seem unfavorable." After reviewing this record the commission cites "the sincere conviction of a large proportion of those who ship freight that many of the rates have become too high for either the railroads' or the public's health."

The decline in the average ton-mile revenue, a fact of which "the railroads

have made much," the commission calls "misleading." The drop, it says, has been caused largely by voluntary reductions to meet competition, while rates "on the traffic which still is affected little, if at all, by competition have stayed up—it is of these non-competitive rates that shippers complain." A footnote here asserts that the railroads "have without protest permitted widespread publicity indicating that average ton-mile revenue is lower in this country than in any foreign countries, and drawing the conclusion, expressly or by implication, that American railroads are superior in economy and efficiency." Such a conclusion, the footnote adds, "cannot properly be drawn from such data, as average ton-mile revenues vary widely with the length of the haul and the character of the traffic—in foreign countries, the average haul is usually much shorter, more low-grade freight is carried by water, and the distinction which we make between express and freight is not maintained."

The commission does concede that its procedure "is in some respects more cumbersome than we would like;" but it is bound by the law and has learned by experience to take care in making records which will stand up in court. In this connection those seeking rate reductions "have suffered more severely from delays than have the railroads when seeking increases." The latter proceedings "have been expedited at the expense of other work;" but they "cannot be heard in the twinkling of an eye, and the evidence submitted must be considered."

FINANCIAL REORGANIZATIONS

After noting the existence of "a considerable body of opinion to the effect that the railroads are suffering from labor conditions that are arbitrary or unreasonable," the report by-passes that matter as a subject "beyond the province" of the commission. As to the suggestion that financial reorganizations will bring the solution, the report reiterates that heavy indebtedness, "while an important contributory factor, has not been a primary cause of railroad ills." It is recognized that "some of the load must be dropped," but the commission nevertheless lists many reasons which make it "clear that the 'wringer' of drastic financial reorganization is not a complete, adequate or wholly just answer to the 'railroad problem', necessary as it may be in many instances." Previously, it had stated that "if the railroads are to be operated successfully under private ownership, they must have earnings sufficient to make not only their bonds but also their stocks attractive to investors;" that "the system of private ownership and operation is dependent on the profit motive and will not work unless, sooner or later, profits are forthcoming;" and that "no one can contemplate the wiping out by reorganization of the equities of large groups . . . without keenest regret."

Discussing delays in reorganization, the commission points out how, in such proceedings, it must deal with exceedingly complex capital structures, and how, under recent unpredictable business conditions, reorganization plans prepared in the light of an apparent trend virtually became "ob-

NO. 78 OF A SERIES OF FAMOUS ARCHES OF THE WORLD



VADO VIADUCT

ITALY

The Vado Viaduct, situated on the new direct route between Bologna and Florence, in Northern Italy, is one of the many new viaducts constructed on the Italian State Railways in recent times. This route involved many striking engineering feats, and the new tracks replace the former difficult route across the Apennine Range. The viaduct, constructed of local stone and brick, consists of fourteen massive arches, each of approximately 30 meter span. The height

above the bed of the River Setta is 35 meters.

* * * * *

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solete over night." Nevertheless it has endeavored to expedite proceedings "in every feasible way—often against the objection of many interested parties, and sometimes when all objected." The "greater part" of the preliminary work has now been done, "and decisions are being rendered."

Turning to the subject of "financial exploitation," the commission recalls "grave financial abuses in the past," but it does not regard such abuses as a primary cause of present railroad distress. And while "banker influence" has at times been "marked," there is "little evidence that it is now dominant;" for the time being "the great railroad banker is the Reconstruction Finance Corporation." The report goes on, however, to suggest that "how to get directors of the right calibre and character, with adequate time to give to the office, is one of the serious problems of private management." The "evident tendency" to remove central railroad offices from New York, to relocate them in the territory served and to choose directors from that territory, it adds, "is in the right direction." Its own work of policing financial matters, the commission notes, has been retarded by the assignment of its accountants to congressional investigating committees, among them Senator Wheeler's sub-committee investigating railway finances.

With respect to the idea that "modernization of equipment" is the answer, the commission expresses the view that both the need for and benefits of modernization have been exaggerated, adding, however, that "it does offer opportunities for solid substantial gain, which can be realized if the necessary funds can be made available." Railroad properties in general, it had previously pointed out, "are less antiquated than some think although capable of much improvement." Recent improvement in passenger service "has been more notable in the field of long-haul, and particularly luxury, travel than elsewhere;" in freight service "there has been a great improvement in speed," while many roads "are using trucks in lieu of local way-freight service with much advantage."

MODERNIZATION POSSIBILITIES

The future, in the opinion of the commission, "seems to hold opportunities, among others, for electrification of lines with a high density of traffic, for other improvements in motive power, for reduction in the weight of equipment as special steels or other metals are further developed, for widespread use of containers interchangeable with highway and water carriers, for the use of small gas-propelled or other motive-power units for branch-line service, and for the development of light, attractive, and comfortable self-propelled cars for short-haul passenger service." Also, the railroads "have suffered from the lack of a properly-equipped central research and engineering staff, such as many other large industries have, to concentrate on the development of better types of equipment and facilities and to promote a greater degree of standardization and simplified practice with respect, not only

to the larger units of property, but also to materials and supplies."

In defining "consolidation and co-ordination," the commission illustrates the latter by reference to the Railway Express Agency and Pullman Company set-ups; but throws in a footnote to say that "in both instances the plan of co-ordination is capable of considerable improvement." The discussion of consolidation cites various proposals in that connection, such as the "extreme possibility" of amalgamation into one system, and the seven-system plan (the Prince Plan), "which has received much attention." It is conceded that "theoretically" wastes and duplications could be eliminated if all roads were merged into one system; but "practically such consolidation could be accomplished only by compulsory legislation." And "it would be difficult to draft such legislation so that it would stand the test in court, more difficult to obtain its enactment, and still more difficult to carry it into effect." On the other hand, if co-ordination were resorted to "the chances that much could be accomplished without compulsion would be greater." (As noted in last week's issue, President Roosevelt's committee-of-six did not think much of the co-ordination idea; it rather favored consolidations in cases where it was deemed desirable to eliminate duplications.)

CONSOLIDATIONS AND CO-ORDINATIONS WILL ENCOUNTER OPPOSITION

Both consolidation and co-ordination, the commission goes on, "are certain to encounter opposition"—many railroad executives fear loss of position or prestige, employees are hostile, communities are apprehensive, and the public generally "is suspicious of any limitation on competition." Nevertheless, the commission thinks there are opportunities for economy and efficiency in consolidation and co-ordination, which cannot be ignored as they might have been in a different day which is now gone, leaving the railroads a choice "between continued retrogression and the marshalling of all resources in an endeavor to progress, if possible, and at least to hold their own."

Under "competition" the report notes the "remarkable development" of highway, water and air transport—the latter "was born and grew like Jack's bean stalk." Also, it points out that the "extraordinary development" of highway transportation "could not have been accomplished, save for the expenditures of billions of federal and state funds." Public funds "have likewise been responsible for the building of the Panama Canal and for the construction and improvement of many inland waterways, harbors and docks," while "similar aid has been given to air transportation." Although the bankruptcy of a large number of railroad companies "has attracted much attention," they are not the only carriers that have suffered from the "vast increase in the supply of transportation facilities accomplished . . . without any general plans, prevision of results, or attempt to shape or control them on the part of the government." As a result "the carriers are engaged in a savage fight

for business, and with little regard for relative operating costs. . . . The extent to which carriage on a marginal basis is increasing is one of the alarming aspects of the present transportation situation. . . . Cost-of-service is the touch-stone of competition, and consequently it is rapidly disrupting a rate structure which was built on other principles."

Turning again to government aids to agencies competing with the railways, the commission asserts that "in determining the real cost and economic utility of the services which such facilities provide, these public expenditures must be taken into account." It predicts that the results of former Co-ordinator Eastman's study of public aids to transportation "will be published within the next few months." (The report of the Splawn-Eastman-Mahaffie committee anticipated last April that this Eastman study would "soon be available in print.")

GOVERNMENT HAS NO MAGIC TO TURN ECONOMIC TIDE

Coming to its "General Conclusions" the commission finds that the railroad problem "is the product of economic conditions;" and that "it is not the same problem today as in former years, because these conditions continually change." And "the government has no magic which enables it to sweep back the tide of economic change, and reverse the result"—this remark being the follow-through from the above-mentioned warning that the railroad problem will not be solved "out-of-hand . . . like a cross-word puzzle." Neither does the commission think that the government can confine its attention to the railroads—it has "no more interest in one form of transportation than in another, and its objective must be to secure for the country the most efficient and the most economical system of transportation possible regardless of the agencies used."

"Basically," the report goes on, "the financial condition of the railroads can be improved, apart from a government subsidy, only by an increase in revenues or a decrease in expenses or both." Thus "it may be hoped" that the recent improvement in general business "will continue and grow." Opportunities for increasing revenues by raising rates "have been explored" and further increases "may at any time be proposed by the railroads;" while the carriers have "very freely" reduced rates where such action was calculated to add to revenues. Meanwhile, as noted above, the commission favors the elimination of land-grant rates; that would augment revenues "to a minor extent." As for expenses, wages "constitute the largest item" and they have received consideration "with results which are a matter of recent history." Materials and supplies account for the remainder of operating expenses, but the price level of commodities is not a matter the commission is "prepared to discuss."

Having thus disposed of revenue-raising and expense-cutting possibilities which "might seem to offer some promise of quick results," the commission turns to other means "less direct and speedy in their

(Continued on page 109)

11 Months N. O. I. \$323,352,148

Rate of return was 1.34 per cent—November's net \$49,664,682

Class I railroads of the United States in the first 11 months of 1938 had a net railway operating income of \$323,352,148 which was at the annual rate of return of 1.34 per cent, according to reports to the Bureau of Railway Economics of the Association of American Railroads. In the first 11 months of 1937, the net was \$564,209,041 or 2.34 per cent, and in the first 11 months

district for the first 11 months totaled \$1,528,293,175 a decrease of 20.3 per cent compared with 1937, and a decrease of 37.2 per cent compared with 1930. Operating expenses totaled \$1,150,277,168, a decrease of 17 per cent below the same period in 1937, and a decrease of 36.2 per cent below the first 11 months of 1930. The Eastern district net for November was \$26,300,122 compared with \$17,089,277 in November, 1937, and \$28,102,384 in November, 1930.

In the Southern district the net for the first 11 months was \$52,290,511 or 1.83 per cent; for the same period in 1937, it was \$68,503,741 or 2.38 per cent, and for the same period in 1930 it was \$79,637,041 or 2.63 per cent. Gross in the Southern

CLASS I RAILROADS—UNITED STATES

Month of November

	1938	1937	1930
Total operating revenues	\$319,681,838	\$318,180,376	\$394,261,533
Total operating expenses	231,257,086	249,295,347	295,812,115
Taxes	27,761,636	26,025,104	25,418,475
Net railway operating income	49,664,682	32,519,097	61,175,416
Operating ratio—per cent	72.34	78.35	75.03
Rate of return on property investment—per cent ..	2.32	1.52	2.88

Eleven Months Ended November 30

	1938	1937	1930
Total operating revenues	\$3,247,154,629	\$3,865,747,780	\$4,906,580,018
Total operating expenses	2,489,524,908	2,875,710,231	3,636,468,116
Taxes	314,284,740	304,604,154	328,645,340
Net railway operating income	323,352,148	564,209,041	820,214,052
Operating ratio—per cent	76.67	74.39	74.11
Rate of return on property investment—per cent ..	1.34	2.34	3.38

of 1930, it was \$820,214,052 or 3.38 per cent. The November net railway operating income was \$49,664,682 or 2.32 per cent, as compared with \$32,519,097, or 1.52 per cent in November, 1937, and \$61,175,416 or 2.88 per cent in November, 1930.

Gross operating revenues for the first 11 months of 1938 totaled \$3,247,154,629 compared with \$3,865,747,780 for the same period in 1937, and \$4,906,580,018 for the same period in 1930, a decrease of 16 per cent below 1937, and 33.8 per cent below 1930. Operating expenses for the 11 months amounted to \$2,489,524,908 compared with \$2,875,710,231 for the same period in 1937, and \$3,636,468,116 for the same period in 1930—13.4 per cent less the former and 31.5 per cent below 1930.

Class I roads in the first 11 months of 1938 accrued \$314,284,740 in taxes compared with \$304,604,154 in the same period in 1937, and \$328,645,340 in the same period of 1930. For November, tax accruals amounted to \$27,761,636, an increase of \$1,736,532 or 6.7 per cent above November, 1937. Thirty-four Class I roads failed to earn expenses and taxes in the first 11 months of 1938, of which 14 were in the Eastern district, five in the Southern district and 15 in the Western district.

The November gross amounted to \$319,681,838 compared with \$318,180,376 in November, 1937, and \$394,261,533 in November, 1930; operating expenses totaled \$231,257,086 compared with \$249,295,347 in the same month in 1937, and \$295,812,115 in November, 1930.

Class I roads in the Eastern district for the first 11 months had a net of \$168,729,046, or 1.49 per cent. For the same period in 1937, their net was \$319,168,625 or 2.83 per cent, while in 1930 it was \$416,555,979 or 3.78 per cent. Gross in the Eastern

district for the 11 months amounted to \$428,505,211, a decrease of 10 per cent compared with the same period in 1937, and a decrease of 27.7 per cent under the same period in 1930; operating expenses totaled \$326,780,982, a decrease of nine per cent below the same period in 1937, and a decrease of 29.8 per cent under 1930. The November net in the Southern district was \$6,145,150 compared with \$4,151,553 in November, 1937, and \$6,472,898 in November, 1930.

Class I roads in the Western district for the 11 months had a net of \$102,332,591 or 1.02 per cent. For the same 11 months in 1937, the railroads in that district had a net of \$176,536,675 or 1.61 per cent, while for the same period in 1930 it was \$324,021,032 or 3.16 per cent. Gross in the Western district for the 11 months amounted to \$1,290,356,243, a decrease of 12.3 per cent below the same period in 1937, and a decrease of 31.3 per cent under the same period in 1930. Operating expenses totaled \$1,012,466,758, a decrease of 10.4 per cent compared with the same period in 1937, and a decrease of 25.9 per cent under the same period in 1930. For November, the roads in the Western district reported a net of \$17,219,410 compared with \$11,278,267 in November, 1937, and \$26,600,134 in November, 1930.

Acme Order Postponed Indefinitely

The Interstate Commerce Commission has further postponed, "pending further order of the commission" the effective date of its order in the case involving the status of Acme Fast Freight, Inc. The commission's decision in this case was reviewed in the *Railway Age* of July 23, 1938, page 166.

Railroads Attack Feather-Bed Rules

Adjustment Board decision is challenged in court action by Washington Terminal

In what is believed to be the first court test of the National Railroad Adjustment Board's power in a "feather-bed rule" case the Washington Terminal Company, owner of the Washington, (D. C.) Union Passenger Station, filed suit in the United States District Court for the District of Columbia on December 29, challenging the demand of the Brotherhood of Locomotive Firemen & Enginemen and the Brotherhood of Railroad Trainmen that the Terminal be required to employ special additional switch engine crews to back trains of empty cars between the passenger station and the storage yard.

The Terminal Company's announcement points out that this work has hitherto been performed by the engine crew which brings the train in over the road; and this is still being done, despite a recent decision of the Adjustment Board.

The suit, which has the backing of the tenant lines in the station, the Pennsylvania, the Baltimore & Ohio, the Southern, the Chesapeake & Ohio and the Richmond, Fredericksburg & Potomac, is of a civil nature and asks for a declaration by the court under the Declaratory Judgments Act of the rights of the plaintiff under a contract of February 1, 1923, which sets up the rules and conditions under which the Terminal employees are employed. Instead of naming the three Brotherhoods which signed the 1923 contract, the suit names as defendants 54 employees of the Terminal in their individual capacities.

The case, according to the Terminal Company, represents "a glaring example" of penalty rules sought to be imposed on the railroads which compel them to pay for work not done or for unnecessary work. Since the road engine which brings a train from New York or Pittsburgh or Richmond to Washington has to go to the roundhouse and since the yard where empty trains are stored is between the station and the roundhouse, it has always been the practice, and a "reasonable" one, Terminal officers claim, when necessary to secure prompt and efficient operation, to have the road engine on its way to the roundhouse take its empty train to the storage yard and leave it there. The statement of the Terminal company also goes on to say that "The demand of the Brotherhood, if acquiesced in, would either require that extra and unnecessary switch engines and their crews should be brought into the station for hauling the empty trains to the yard or else that an extra and unnecessary crew, with nothing to do, employed by the Terminal, should ride with the road engineman and fireman from the station to the storage yard where the empty trains are put away".

The Terminal company claims that to bring extra yard engines into the station to put away all empty passenger trains

(Continued on page 104)

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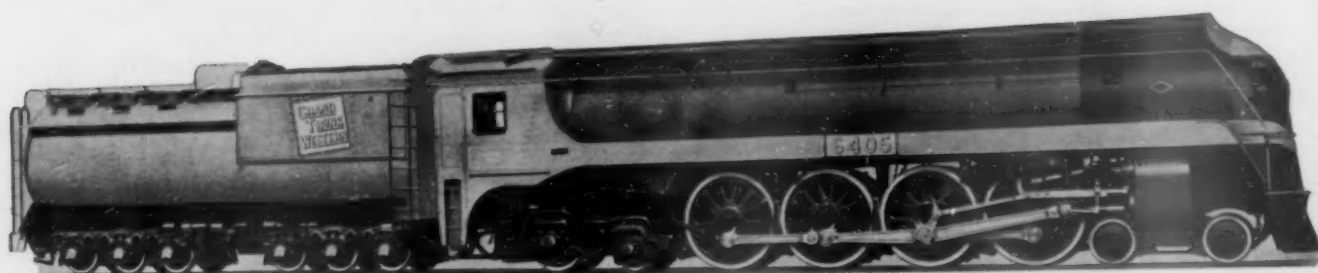
Modern Power is...



2-8-4 type locomotive built by Lima for the Pere Marquette Railway Company



4-8-4 type locomotive built by Lima for the Soo Line



4-8-4 type locomotive built by Lima for the Grand Trunk Western



12-10-4 type locomotive built by Lima for the Kansas City Southern Railway

LIMA LOCOMOTIVE WORKS,

Profitable Power

THE outstanding characteristic of all road locomotives purchased during the past year is high hauling capacity at high speed. ' ' ' Such power sets a standard of operation for the entire railroad that Modern Power alone can maintain. ' ' ' The result of their operation is a substantial decrease in maintenance with an increase in locomotive net earnings.



S, INCORPORATED, LIMA, OHIO

NET INCOME OF LARGE STEAM RAILWAYS WITH ANNUAL OPERATING REVENUES ABOVE \$25,000,000

(Switching and Terminal Companies Not Included)

Name of railway	Net income after deprec.		Net income before deprec.	
	1938	1937	1938	1937
	For the ten months of		For the ten months of	
Alton R. R.	\$1,408,345	\$709,828	\$1,135,506	\$412,475
Atchison, Topeka & Santa Fe Ry. System [*]	5,110,190	6,390,393	15,089,388	15,918,365
Atlantic Coast Line R. R.	1,837,331	2,196,800	98,695	3,882,503
Baltimore & Ohio R. R.	12,159,416	573,363	6,076,143	6,600,794
Boston & Maine R. R.	4,239,626	221,440	2,897,691	1,563,689
Central of Georgia Ry. [†]	2,548,851	1,840,181	1,835,092	1,177,020
Central R. R. of New Jersey	3,188,906	1,243,331	2,010,219	50,034
Chesapeake & Ohio Ry.	16,682,836	29,407,270	23,596,403	36,290,957
Chicago & Eastern Illinois Ry. [‡]	1,433,706	620,966	929,434	109,483
Chicago & North Western Ry. [‡]	13,633,121	12,596,549	9,413,118	8,429,204
Chicago, Burlington & Quincy R. R.	1,755,472	3,322,655	5,996,333	7,359,347
Chicago Great Western R. R. [‡]	1,217,297	879,739	766,876	435,741
Chicago, Milwaukee, St. Paul & Pacific R. R. [‡]	16,238,432	11,465,482	11,452,084	6,914,049
Chicago, Rock Island & Pacific Ry.	10,199,497	8,232,440	6,745,624	4,832,960
Chicago, St. Paul, Minneapolis & Omaha Ry.	2,334,502	2,296,018	1,845,353	1,801,460
Delaware & Hudson R. R.	640,106	613,898	230,730	267,479
Delaware, Lackawanna & Western R. R.	3,638,968	257,496	1,582,740	1,835,473
Denver & Rio Grande Western R. R. [‡]	5,422,076	5,071,762	4,425,018	4,109,695
Elgin, Joliet & Eastern Ry.	285,428	1,626,701	548,028	2,381,268
Erie R. R. (including Chicago & Erie R. R.) [‡]	9,645,630	1,527,033	6,532,356	4,701,285
Grand Trunk Western R. R.	4,783,627	622,648	3,845,053	247,450
Great Northern Ry.	614,689	8,800,235	2,487,149	11,835,523
Illinois Central R. R.	57,389	365,722	5,471,805	4,821,152
Lehigh Valley R. R.	3,314,355	909,260	1,510,937	964,143
Long Island R. R.	1,611,395	1,634,495	631,028	660,802
Louisville & Nashville R. R.	1,764,805	6,595,091	5,372,848	10,073,594
Minneapolis, St. Paul & Sault Ste. Marie Ry. [‡]	5,513,483	4,349,833	4,489,845	3,366,632
Missouri-Kansas-Texas Lines	3,237,920	1,047,454	2,131,142	54,515
Missouri Pacific R. R. [‡]	12,962,667	6,334,777	9,316,510	2,832,024
New York Central R. R. [‡]	20,518,021	7,404,443	7,101,386	20,794,426
New York, Chicago & St. Louis R. R.	1,552,067	2,130,978	136,600	3,500,715
New York, New Haven & Hartford R. R. [‡]	11,233,167	5,552,145	8,390,941	2,739,212
Norfolk & Western Ry.	14,714,935	26,845,205	18,874,093	30,854,516
Northern Pacific Ry.	7,134,193	1,600,779	4,303,662	1,101,993
Pennsylvania R. R.	5,558,865	28,018,576	26,915,863	48,939,517
Pere Marquette Ry.	2,475,004	1,628,810	475,685	3,760,431
Pittsburgh & Lake Erie R. R.	1,242,038	3,897,632	3,112,129	5,486,671
Reading Co.	2,171,505	6,134,661	4,787,512	8,714,776
St. Louis-San Francisco Ry. [‡]	9,931,790	5,479,366	7,326,241	2,853,711
St. Louis Southwestern Lines [‡]	1,127,098	680,105	609,472	180,852
Seaboard Air Line Ry. [†]	6,610,068	4,243,565	4,908,359	2,612,523
Southern Ry.	2,381,421	1,046,996	170,235	3,647,172
Southern Pacific Transportation System [‡]	7,478,449	2,161,027	608,526	8,893,999
Texas & Pacific Ry.	782,384	1,945,246	1,779,094	2,907,259
Union Pacific R. R. (including leased lines)	11,764,533	12,326,712	17,860,194	17,989,416
Wabash Ry. [†]	5,601,104	2,514,894	3,808,261	728,220
Yazoo & Mississippi Valley R. R.		878,988	445,849	1,291,086

* Deficit.

† Report of receiver or receivers.

‡ Report of trustee or trustees.

§ Under trusteeship, Erie R. R. only.

|| Includes Atchison, Topeka & Santa Fe Ry., Gulf, Colorado & Santa Fe Ry., and Panhandle & Santa Fe Ry.

† Includes Boston & Albany, lessor to New York Central R. R.

|| Includes Southern Pacific Company, Texas & New Orleans R. R., and leased lines. The report contains the following information: "Income reported hereon excludes offsetting debits and credits for rent for leased roads and equipment, and bond interest, between companies included herein; also excludes dividends received from certain separately operated solely controlled affiliated companies during period January 1 to October 31, 1937, of \$170,000 for the reason that the offsetting charges by such companies are made against profit and loss and therefore would not be offset in the net deficit of such companies. Operations of all separately operated solely controlled affiliated companies, resulted in a net deficit of \$5,335,526 for the ten months ended October 31, 1938, and \$2,985,178 for the ten months ended October 31, 1937, which is not reflected in this statement. Interest on bonds of, and rental income from, separately operated solely controlled affiliated companies, whether earned or not, are included in this statement, in order that such income credits will offset income debits reflected in the net deficit of such companies mentioned hereinbefore."

reported net incomes for the 10 months, as compared with 71 during the same period of 1937. The consolidated statement and that showing the net income of roads having operating revenues above \$25,000,000 are given in the accompanying tables.

Club Meetings

The Canadian Railway Club will hold its next meeting on January 16 at 8:15 at the Windsor hotel, Montreal, Que., at which time four members of Montreal Board of Trade will hold a debate.

Canadian Earnings Up in November

A sharp decrease in operating expenses combined with a moderate increase in gross to give the Canadian National in November the second widest gain in net operating revenues over the 1937 period of the current year. Gross for the month totaled \$16,785,084, an increase of \$11,557 over the \$16,773,527 reported a year ago. Ex-

penses were down \$910,480 from \$14,854,300 to \$13,943,820 leaving net operating revenues for the period at \$2,841,264 against \$1,919,227, a gain of \$922,037.

Gross revenues for the eleven months ended November 30 totaled \$167,057,671 as against \$182,177,183 a year ago. Expenses were down \$4,277,718 to \$162,020,800 from \$166,298,518 leaving net for the period at \$5,036,871, a decrease of \$10,841,794 from the \$15,878,665 reported a year ago.

An increase of \$565,647 has been reported by the Canadian Pacific Railway in November net operating revenues of \$4,029,480, compared with \$3,463,833 in the corresponding month of 1937. Operating expenses dropped \$527,970 to \$9,000,363, against \$9,528,333 a year ago, while gross revenues were \$37,676 higher at \$13,029,844, compared with \$12,992,167.

Decline of \$3,410,176 was shown in net operating revenues \$17,406,704 for the 11 months ended November 30, compared with \$20,816,881 in the corresponding period of 1937. Operating expenses increased \$897,-

380 to \$112,903,821, against \$112,006,441, while gross declined \$2,512,796 to \$130,310,526, compared with \$132,823,322.

Chicago Traffic Club Dinner

The Traffic Club of Chicago will hold its thirty-second annual dinner at the Palmer House in Chicago on January 19. The speaker will be Dr. Allen A. Stockdale, chairman of the Speakers Bureau of the National Association of Manufacturers, and his subject will be "A Tribute to Democracy."

Central Railway Club Marks Golden Anniversary

The Central Railway Club of Buffalo will hold its golden anniversary dinner on Thursday, January 12, at the Hotel Statler, Buffalo, N. Y. The guest of honor will be Joseph R. Hanley, state senator, New York. The delegation from New York will leave on a special train from Erie terminal, Jersey City, N. J., at 6:30 p. m., January 11.

West Shore Ferry Fares

The Interstate Commerce Commission, Division 2, has denied the application of the West Shore for authority to establish a six-cent fare on its Wehawken, N. J.-West Forty-Second street, New York, ferry, and a 10-cent fare on the Cortlandt street line; but the order requiring the cancellation of the suspended schedules is without prejudice to the filing of others establishing a fare of five cents on the Forty-Second street line and one of eight cents on the Cortlandt street line. The present fares are four cents and six cents, respectively.

Commissioner Caskie, concurring in part, agreed that five- and eight-cent fares had been justified for single-trip tickets, but he was not convinced that lower-rate monthly or multiple-trip tickets should not be required.

Streamliners Cover More Than 500,000 Miles in Year

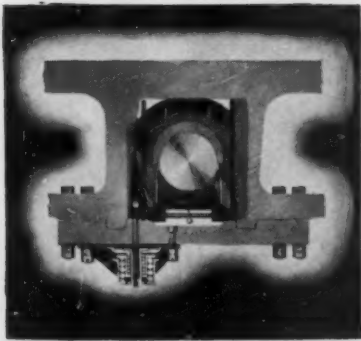
A total of 547,200 miles were covered by the Streamliner-City of Los Angeles of the Union Pacific-Chicago North Western, and the Streamliner-City of San Francisco, owned and operated jointly by these two roads and the Southern Pacific during their first year of operation. The former was placed in service between Chicago and Los Angeles on December 27, 1937, and the latter between Chicago and San Francisco on January 2, 1938. The City of Los Angeles traveled 276,000 miles and the City of San Francisco 271,200 miles, on a schedule of five trips a month. During the first ten months of the year, the City of Los Angeles carried 13,276 passengers, and the City of San Francisco 14,876. Gross revenues for the City of Los Angeles for the first ten months were \$1,322,607, while earnings amounted to \$3.45 per mile. Gross revenues for the City of San Francisco for the period were \$1,022,536, while earnings amounted to \$4.06 per mile.

Freight Car Loading

Loading of revenue freight for the week ended December 24, totaled 574,462 cars, a decrease of 31,852 cars or 5.3 per cent be-

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Reduced maintenance..increased passenger ...with these FRANKLIN



Franklin Automatic Compensator and Snubber
for Friction Bearing Driving Boxes

FRANKLIN AUTOMATIC COMPENSATOR AND SNUBBER



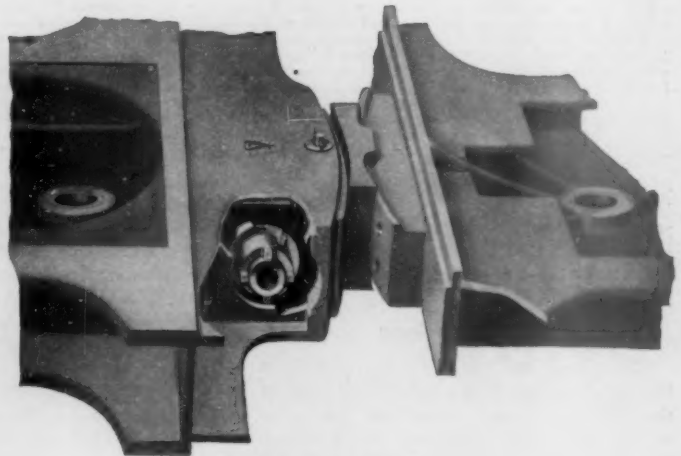
Franklin Automatic Compensator and Snubber
for Roller Bearing Driving Boxes

Repeated trips to the repair shop caused by pounding driving boxes can be readily eliminated by the application of Franklin Automatic Compensators & Snubbers. With their application, accurate adjustment is constantly maintained, wear and temperature change are automatically

compensated for, and the running gear protected. Roller bearing journal boxes with their limited clearances benefit particularly. Incorporate Compensators & Snubbers and obtain lower maintenance, easier riding, and increased availability for service.

Franklin E-2 Radial Buffer

Slack and pound are eliminated, and passenger comfort increased, when you install the Franklin E-2 Radial Buffer. The Buffer permits full freedom of lateral and vertical movement. Maximum safety is assured as the Buffer does not interfere with proper tracking. The Franklin E-2 Radial Buffer quickly pays for itself . . . in Economy . . . in Safety . . . in Increased Passenger Comfort . . . and in Lowered Maintenance.



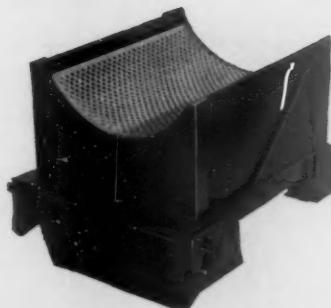
Franklin E-2 Radial Buffer

FRANKLIN RAILWAY
NEW YORK

comfort... and longer service life...

ECONOMY DEVICES

THE NEW FRANKLIN No. 8 LUBRICATOR & SPREADER

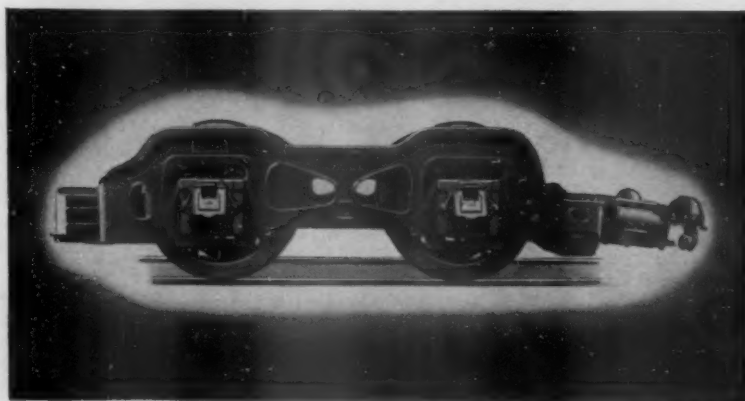


Franklin No. 8 Lubricator
and Spreader

Weight has been drastically reduced in this New Lubricator & Spreader . . . and an even better lubricating job is being done. This has been made possible by the use of fabricated steel, and results in a stronger, more snugly fitting unit that weighs less than half of the old cast steel

spreader, cellar and end plate. The cellar, which weighs only 10 lbs. (43 lbs. less than a cast steel cellar) is reversible and is more easily handled. It greatly facilitates changing when a new grease application becomes necessary. The end plate fits more snugly and is locked securely in place.

The Locomotive Booster



Franklin Locomotive Booster

Modern high speed locomotives are built with a minimum weight on drivers to reduce track stresses. This often results in a deficiency in starting power. To compensate for this deficiency, Locomotive Boosters are being incorporated to give the added power necessary for smooth, quick starts and for the tough spots on the road. Keep your locomotive balanced both at high speeds and in starting . . . Install Booster Power.



SUPPLY COMPANY, INC.

CHICAGO

MONTREAL

low the preceding week, a decrease of 139,403 cars or 19.5 per cent below the corresponding week in 1930, but an increase of 116,641 cars or 25.5 per cent above the same week in 1937. All commodity classifications except coal and ore showed decreases under the preceding week, but all commodity classifications showed increases over the same week last year. The summary, as compiled by the Car Service Division, Association of American Railroads, follows:

Revenue Freight Car Loadings

For Week Ended December 24, 1938

Districts	1938	1937	1936
Eastern	126,202	98,730	127,951
Allegheny	107,786	82,372	118,454
Pocahontas	42,035	29,845	38,278
Southern	90,508	71,678	82,337
Northwestern	68,963	55,478	64,168
Central Western	94,644	79,797	83,347
Southwestern	44,324	39,921	48,043
Total Western Districts	207,931	175,196	195,558
Total All Roads	574,462	457,821	562,578
Commodities			
Grain and Grain Products	30,724	27,419	24,186
Live Stock	11,997	9,541	9,861
Coal	133,799	101,829	123,956
Coke	6,636	4,870	10,427
Forest Products	27,612	20,449	28,399
Ore	9,001	7,002	7,523
Merchandise l.c.l.	140,900	119,434	133,127
Miscellaneous	213,793	167,277	225,099
December 24	574,462	457,821	562,578
December 17	606,314	600,283	730,048
December 10	619,340	619,266	739,096
December 3	649,086	620,325	745,295
November 26	562,084	555,762	680,300

Cumulative Total,
51 Weeks29,968,649 37,215,558 35,528,839

In Canada.—Car loadings for the week ended December 24 totaled 38,371, compared with 42,077 in the preceding week and 39,275 in the preceding year, according to the compilation of the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
Dec. 24, 1938	38,371	20,728
Dec. 17, 1938	42,077	23,076
Dec. 10, 1938	43,024	23,247
Dec. 25, 1937	39,275	22,297

Cumulative Totals for Canada:

Dec. 24, 1938	2,397,454	1,062,263
Dec. 25, 1937	2,591,329	1,335,600
Dec. 19, 1936	2,442,248	1,212,768

Reactions to Committee-of-Six Report

Directors of the Association of American Railroads on December 30 endorsed the findings of the President's committee-of-six, whose report was reviewed in last week's *Railway Age*. At the same time the National Grange sent a letter to Senator Wheeler, chairman of the Senate interstate commerce committee, protesting against several parts of the report.

On Capitol Hill Chairman Lea of the House committee on interstate and foreign commerce, announced that his committee would begin hearings on an omnibus railroad bill on or about January 17. It is understood that the committee-of-six is helping to draft such a bill.

At the same time the trucking industry, speaking through the American Trucking Associations in its weekly publication, "Transport Topics," characterizes the report of the committee-of-six as a "one-sided" one and the proposals contained

President's Message Makes General Reference to Rails

President Roosevelt made two brief general references to the railroad situation in his message to Congress on January 4. In a general review of recent legislation he said that with the exception of legislation to provide greater government efficiency and legislation "to ameliorate our railroad and other transportation problems," the past three congresses "have met in part or whole the pressing needs of the new order of things."

Later on the message's listing of factors involved in attaining and maintaining an \$80,000,000,000 national income included among such factors the "reconciliation of enormous antagonistic interests—some of them long in litigation—in the railroad and general transportation field."

therein "inimical to the welfare of the trucking industry." An editorial on the front page compares the meetings of the committee-of-six to the recent meeting at Munich. "On September 28," says the editorial, "Hitler, Mussolini, et al., got together at Munich and carved up Czechoslovakia, the lion's share going to Germany. On December 23, the railroads and their labor unions got together in Washington and made public a proposal to carve up the American trucking industry, the lion's share going to the railroads. The whole world was aghast at the first performance. The American trucking industry is aghast at the second. The first feat has been accomplished. The second should be junked."

A. A. R. Safety Poster Turns to Public Relations Theme

Reminding railway employees that there is no better sales talk for railroad travel and shipment than the safety record of the carriers, the poster of the A. A. R.'s Safety section for January urges "Let's All Be Safe Men and Good Salesmen in 1939." Thus by the tie-up between employee-effort for safety and attention to duty and the railroads' talking point, "The Rail Way Is the Safe Way," the A. A. R. seeks to give its safety program added significance.

Highway and Grade Crossing Funds Apportioned

The Secretary of Agriculture on December 30, 1938, announced the apportionment of \$135,000,000 to aid the States in highway improvement and elimination of grade crossings in the fiscal year beginning next July 1. The funds were authorized by the federal-aid highway act of 1938 and consist of \$100,000,000 for improvement of the federal-aid highway system including extensions through cities, \$15,000,000 for secondary or feeder roads, and \$20,000,000 for elimination of hazards at railroad grade crossings. The highway funds are to be

matched by the States but those for grade crossings are available without matching. All expenditures are to be made in cooperation with the State highway departments.

The apportionment of grade crossing funds follows:

State	Grade Crossings
Alabama	\$393,552
Arizona	125,461
Arkansas	343,731
California	728,856
Colorado	251,215
Connecticut	167,075
Delaware	97,500
Florida	277,471
Georgia	477,283
Idaho	161,779
Illinois	1,030,486
Indiana	506,736
Iowa	545,468
Kansas	504,959
Kentucky	356,846
Louisiana	310,856
Maine	135,191
Maryland	200,663
Massachusetts	408,286
Michigan	649,147
Minnesota	524,721
Mississippi	310,650
Missouri	596,184
Montana	261,252
Nebraska	347,689
Nevada	97,500
New Hampshire	97,500
New Jersey	389,614
New Mexico	166,957
New York	1,335,949
North Carolina	500,977
North Dakota	309,164
Ohio	833,853
Oklahoma	455,041
Oregon	224,616
Pennsylvania	1,128,616
Rhode Island	97,500
South Carolina	293,750
South Dakota	268,815
Tennessee	373,187
Texas	1,088,862
Utah	129,236
Vermont	97,500
Virginia	373,906
Washington	300,063
West Virginia	260,716
Wisconsin	486,074
Wyoming	132,134
District of Columbia	97,500
Hawaii	97,500
Puerto Rico	150,076
Adm. & Eng. Reserve	500,000
Total	\$20,000,000

Wheeler Looks Favorably on Postalization Plan

Added impetus was given to the Hastings postalized rate movement when Senator Wheeler, Democrat of Montana and chairman of the Senate interstate commerce committee, on December 29, spoke favorably of the plan and wrote a letter to Chairman Splawn of the Interstate Commerce Commission in which he asked the I. C. C. chairman to give him his opinion as to the feasibility of the Hastings plan. At the same time Senator Truman, Democrat of Missouri and a member of the Senate interstate commerce committee, endorsed that part of the plan dealing with the postalization of freight rates.

Senator Wheeler's letter to Chairman Splawn follows:

"My dear Chairman:

"For the past five years I have given some thought and attention to the so-called postalization of passenger rates on railroads, which was first presented to me by Mr. Hastings of New York. On its face the plan looks good to me.

"The railroads of this country constitute a mass production industry. In order for a mass production industry to be successful, it must have mass consumption. Mass consumption in railroads means mass use

Continued on next left-hand page

Economical Transportation

Camels are the transportation for the desert . . . their stops for water are few and far between.

Locomotive operation can also be maintained with a minimum of water stops . . . especially when the locomotive is equipped with an Elesco exhaust steam injector. Through the reclamation of heat and moisture in a substantial portion of the exhaust steam, Elesco exhaust steam injectors effect a fuel and *water* savings of from 8% to 12%.

Apply Elesco exhaust steam injectors to your locomotives and cut operating costs.



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of the seats in the chair cars and berths in sleeping cars.

"The only excuse for mass production is that, by such means, an industry can produce better and cheaper goods. What applies to the automobile industry applies to the railroads.

"They must have more business, and the way to get more business is to give the lowest possible rate consistent with sound business principles. It costs as much to pull a coach half full as it does full. There is very little more cost of maintaining roadbeds used by ten trains than by one.

"I am enclosing herewith some cost statements, as well as projected revenue statements, which would indicate that the railroads can be profitably operated with postalized rates.

"The people of this country have demonstrated that they want to travel and see this country. The people of the West want to visit the East, and the people of the East should see the West. More travel means more men working on the railroads, means more employment, more men employed in heavy industry.

"I wish you would have these figures carefully analyzed at your earliest convenience. I want your opinion as to whether it can be worked out on a sound business basis for the railroads."

Senator Truman doubted the feasibility of applying the plan to passenger rates, pointing out that they were low enough already, but went on to say that he believed postalization of freight rates would help the railroad situation.

Truck Shipments in November 1937 Per Cent Ahead of Last Year

For the third consecutive month this year, the movement of freight by truck exceeded in volume the 1937 tonnage, according to truck loading figures for November compiled by the American Trucking Associations, Inc. The November figures represented an increase of 17.37 per cent over the 1936 monthly average. Thus, the ATA truck loadings index figure for November stood at 117.37 compared with 113.38 in October, 1938, and 92.89 in November a year ago.

Comparable reports were received from 169 motor carriers in 34 states who transported an aggregate of 730,569 tons in November, 1938, as compared with 612,015 tons in November, 1937, and 763,858 tons in October, 1938. The volume of freight carried by trucks last month, while showing a 4.4 per cent decrease under the preceding month, represented an increase of 19.4 per cent over the corresponding period last year.

Despite the heavy hauling of automobiles and iron and steel products, the decrease in total tonnage under October, 1938, was attributed, in part, according to the ATA statement, to drivers' strikes in New York, New Jersey, Omaha, Kansas City and other mid-western cities which interfered with normal business.

The only November gains over last month were in the automobile and iron and steel classifications. The former showed an increase of 89.6 per cent over October

and a 37.5 per cent increase over the corresponding month last year. Iron and steel hauling increased 10.1 per cent over October and was 72.9 per cent over the volume of November a year ago. In the general merchandise class, which accounted for slightly more than three quarters of the total volume of freight handled by truck, the November figure was 6.7 per cent under October, but was 19 per cent over November, 1937. While transportation of petroleum products showed a decline of 5.4 per cent under the preceding month, the November volume represented slightly more than a 22 per cent increase over November, 1937.

Mediation Board Report

(Continued from page 101)

with the assertion that without such an agency "the general plan for the maintenance of labor peace and harmony underlying the Railway Labor Act would be incomplete." Then comes the discussion of referee cases, after which the report proceeds to review in turn labor relations in the air transport industry and the problems of the Mediation Board. The latter section is that embodying the above-mentioned discussion of delays and the Board's need for additional personnel.

Earlier in the report the Board had complained that it is continually being diverted from the mediation of management-labor disputes—"its most important duty"—to the settling of differences between labor organizations competing for the right to represent particular crafts or classes of employees. "Unfortunately," it adds, "the greatest need for the holding of such hearings has grown out of disputes over membership between two organizations national in scope, which disputes would never have arisen had the organizations involved exerted the same efforts to agree with one another over their proper jurisdiction that the act expects carriers and employees to exert in the making of labor agreements. . . . Frankly, the Board does not consider that the purposes of the Railway Labor Act are best served by permitting these disputes to acquire sufficient magnitude to make it necessary to refer them to the Board for adjudication." The time spent on such disputes—a large number of which resulted in no change in representation—"was, in the opinion of the Board, entirely out of proportion to the results achieved."

Of the 241 cases decided by the Board during the fiscal year, 138 were these representation cases involving disputes among employees; 101 were cases involving disputes between carriers and employees requiring mediation; and two were interpretation cases of agreements previously mediated. Engine, train and yard service employees "figured most heavily in both representation and mediation cases, while the number of representation cases among the maintenance of equipment employees was also large." The net of the representation disputes during the past three years has been a gain for national labor organizations, while system associations have been losing. Such losses, however, have been less than the gains of the national organizations because of two factors—increases

in the number of employees covered by agreements and losses of local unions. "Local organizations" which disappeared from the list of agreement-holders during the year included: Order of Skilled Railway Maintenance-of-Way Employees; Knights of Labor; the Unlicensed Officers Association; Brotherhood of Dining Car & Sleeping Car Employees' Union. Organizations listed among agreement-holders for the first time are: Inland Boatmen's Union; Brotherhood of Sleeping Car Porters; Brotherhood of Railroad Dining Car Stewards, Chefs and Cooks; International Brotherhood of Redcaps.

The 101 mediation cases disposed of during the year represented a drop from the previous year's 158; the backlog at the close of the year was 117 as compared with 95 on June 30, 1937. Among last year's mediation cases was the first settlement of a dispute involving an air carrier and its employees.

During the fiscal year the National Mediation Board spent \$147,586 of its \$245,826 appropriation. It required only \$2,270 of the \$57,348 allotment for arbitration boards, and but \$7,927 of the \$45,278 available for emergency boards. As pointed out above last fall's wage proceedings before the Stacy-Landis-Millis emergency board did not enter the year under review.

The report of the National Railroad Adjustment Board, appearing in an appendix, is mainly a tabulation of cases handled. This board spent \$230,260.75 of its \$242,565 appropriation.

Railroads Attack Rules

(Continued from page 100)

would greatly congest the operations at many hours of the day and would "hopelessly" congest them at seasons of peak travel, such as holidays, conventions, and the like. On the other hand, to require an extra crew, "with nothing to do," to ride on the road engine which is already manned by an engineman and fireman would involve a "useless expenditure of money." It is further pointed out that in the case of the "complicated and expensive" electric locomotives operated by the Pennsylvania and the Diesel-electric locomotives of the Baltimore & Ohio, yard engineman and firemen employed to operate the steam switching engines of the Washington Terminal would not be sufficiently experienced to handle the electric and Diesel-electric power safely.

Claims of Terminal employees for back pay for work that they might have performed were sustained by the first division of the National Railroad Adjustment Board at Chicago on October 24, 1938, and the Terminal Company contends that, in effect, the Adjustment Board has altered the provisions of the 1923 contract between the Terminal and the employees.

Under the Railway Labor Act, no method is provided whereby a railroad may test out in court an adjustment board's decision, although machinery is set up whereby employees can take court action against any employer who fails to abide by the decision of the board. The Association of American Railroads is sponsor-

ing a number of amendments to the Act, one of which would provide the means whereby a railroad could make a court test of an adjustment board's decision.

B. R. Tolson, manager of the Terminal Company, in a letter to Arthur J. Lovell, national legislative representative of the Brotherhood of Locomotive Firemen & Enginemen and J. A. Farquharson, national legislative representative of the Brotherhood of Railroad Trainmen, detailing his company's attitude regarding the Adjustment Board's recent decision, said that "The decision of the Board is thus nothing less than an attempt to impose an entirely new contract upon the Washington Terminal Company which, as one of its results, will have the effect of interfering with the arrangements which are now and long have been in existence between the tenant railroads and their own employees. The Washington Terminal Company does not believe that under the law the National Railroad Adjustment Board is empowered to make and impose a new contract upon the Company. What our contracts mean and what rights we have under those contracts are legal questions which, we believe, we are entitled, like any other citizen, to have tried out in the Courts."

The complaint of the Terminal Company points out that despite the fact that the employees of the Terminal have not started any court action to enforce their demands which have the sanction of the Adjustment Board, they are demanding back pay from November 23, which now totals approximately \$7,500 or at the rate of approximately \$80,000 a year.

Not only does the complaint contend that the Adjustment Board acted without authority in its decision and that the claims of the men that they should have exclusive right to perform the duties now performed by the enginemen of the railroads, but it goes further to say that the award and order "were made without the due process of law which the plaintiff is entitled under said Article V of the Constitution of the United States in that they were made without a proper or adequate hearing, because made under a procedure which allowed plaintiff no opportunity to test the statements of the claimants by cross-examination, no opportunity to present oral evidence before said Board, and no opportunity to present argument before the referee who decided the dispute and made the award."

The bill in equity asks the court to render a declaratory decree declaring that the defendants do not have the right, under their existing contract, to bring into and take from the station empty cars and engines and that the ward of the Adjustment Board has no legal force and effect in so far as it purports to give the employees any such right.

Whether the next step of the Brotherhoods will be to threaten a strike is not known at this time. Mr. Farquharson refused to comment, saying that his organization would meet the situation in the "same way that any intelligent individual would." Undoubtedly the railroad industry will show considerable interest in the case in view of the fact that similar decisions have been rendered in other parts of the country.

Equipment and Supplies

LOCOMOTIVES

THE MINNESOTA TRANSFER has ordered three 900-hp. Diesel-electric switching locomotives from the American Locomotive Company.

FREIGHT CARS

THE LEHIGH & NEW ENGLAND is inquiring for 100 hopper cars of 50 tons capacity.

THE DELAWARE, LACKAWANNA & WESTERN is placing orders for materials for use on 200 freight cars at its Keyser Valley shops, Scranton, Pa.

PASSENGER CARS

THE UNION PACIFIC plans to air-condition and modernize 74 passenger cars during the early part of 1939 at a cost of \$1,480,000. The majority of the work will be handled in its Omaha shops. Under the program, 13 chair cars will be air-conditioned and modernized, with new seats, light fixtures, parcel racks and interior treatment; 52 chair cars, heretofore air-conditioned, will be given modern interiors; 4 dining cars will be air-conditioned and converted to coffee-shop diners; 1 diner will be air-conditioned and converted to a cafe-lounge car; and 4 observation cars will be converted to limousine type observation cars, with enclosed rear ends and with complete new furnishings and interior decorations.

IRON AND STEEL

THE NORTHERN PACIFIC has ordered 30,000 tons of rails, placing 20,000 tons with the Carnegie-Illinois Steel Corporation, 9,000 tons with the Bethlehem Steel Company and 500 tons each with the Inland Steel Company and the Colorado Fuel and Iron Company.

Construction

PENNSYLVANIA.—The Pennsylvania Public Utility Commission has ordered that the crossing at grade where Ashburner street crosses the four main tracks and one siding track of the Pennsylvania Railroad in Philadelphia, Pa., between Tulip street and State road be abolished. This is to be accomplished by the construction of a crossing above grade at the location of the existing crossing. The estimated cost of the bridge structure is \$142,023 and of the roadway \$127,469. In addition the Pennsylvania Railroad estimates the cost of necessary alteration to its overhead electrical system which it will carry out and of engineering expenses at \$30,220. The Department of Highways will do all the work necessary to complete the remainder of the improvement.

Supply Trade

J. B. Peddle has been appointed representative of the Morden Frog & Crossing Works, Chicago, with headquarters in St. Louis, Mo.

The Ohio Brass Company on January 3, moved its Chicago office from 20 North Wacker Drive to 231-South La-Salle street.

Glenn Griswold Associates, public relations counsellors, now have their new offices at 330 West 42nd street, New York, and 520 No. Michigan avenue, Chicago.

The Universal Railway Devices Company, Chicago, has been incorporated in Delaware to take over and succeed to the business of the Universal Draft Gear Attachment Company, an Illinois corporation, with no change in the officers or personnel.

OBITUARY

Frank Norton Hoffstot, founder and former president of the Pressed Steel Car Company, Inc., Pittsburgh, Pa., died on December 25, as reported in the *Railway Age* of December 31. He was born on May 31, 1861 in Pittsburgh, where he be-



Frank Norton Hoffstot

came active in banking, real estate and the iron and steel industry. Mr. Hoffstot became interested in financing companies and in 1898, Charles T. Schoen, president of the Schoen Pressed Steel Company, received financial backing for his idea of building cars of steel, from Mr. Hoffstot. The Schoen Pressed Steel Company and the Fox Pressed Steel Company were consolidated to form the Pressed Steel Car Company, which was the first to manufacture pressed steel cars and was organized in 1899, with Mr. Schoen as president. In 1901 Mr. Hoffstot became president of the company, remaining in that capacity for 33 years. When the Pressed Steel Car Company went into receivership, Mr. Hoffstot became one of the three receivers and served until the summer of 1934, when he retired and sold all of his interests in the company, since which time he had been active in handling his personal affairs. Mr. Hoffstot was a metallurgist in addition to his other business interests.

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A Far Better

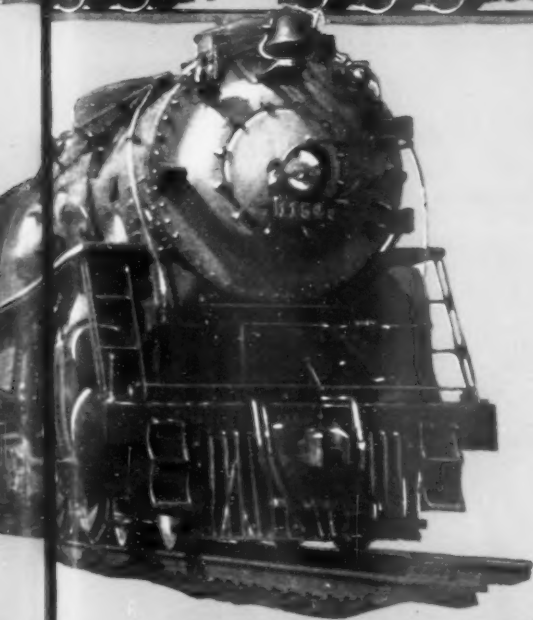
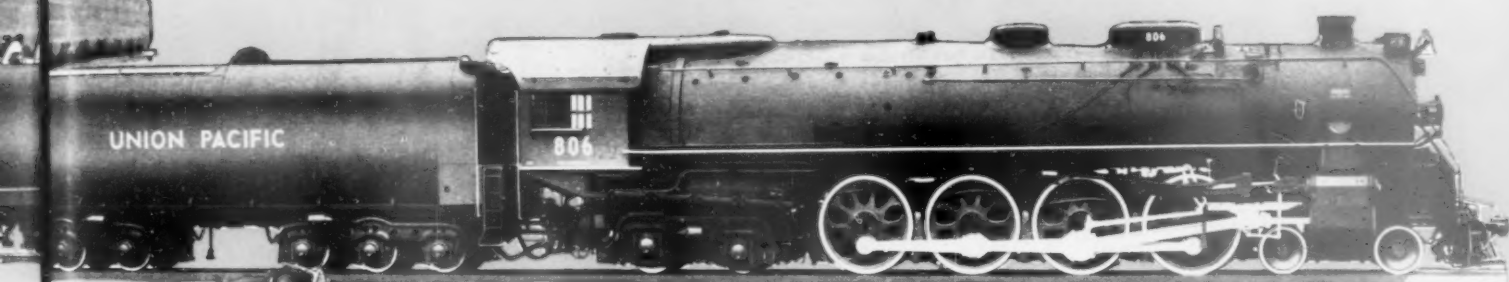
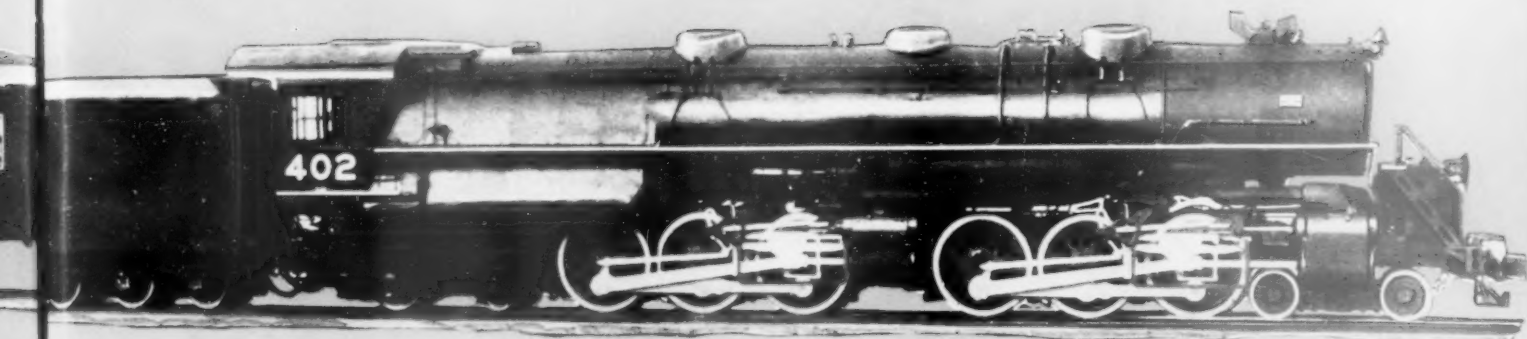


OPERATING ECONOMIES
effected by modern power
represent in some cases savings
of 20 to 40 per cent annually
on the investment.

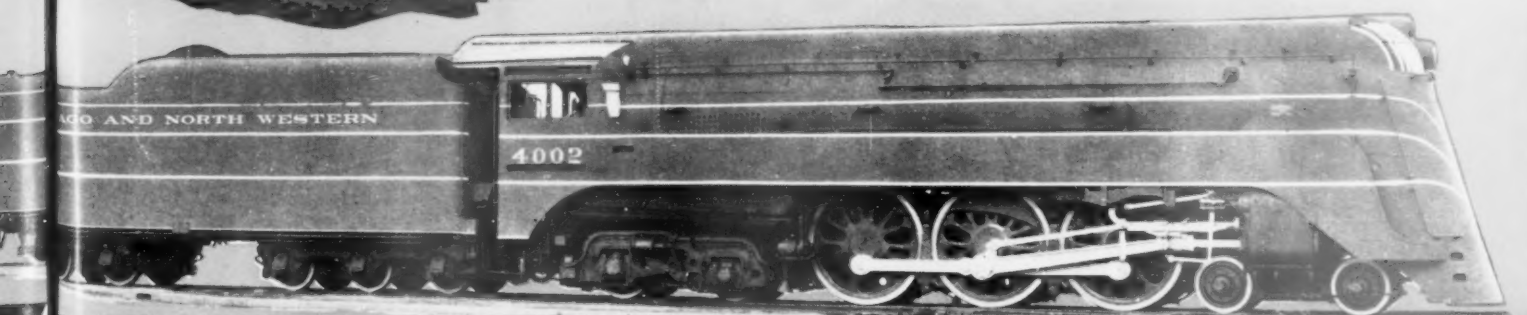


AMERICAN LOCOMOTIVE 30 CHURCH STREET

Operating Ratio



MODERN POWER assures an increase in reserve power, better utilization, higher speeds, longer runs, increased availability, smaller consumption of fuel, reduction in the cost of maintenance, curtailment and possibly even elimination of double heading and helper mileage — in all, A FAR BETTER OPERATING RATIO.



MOTIVE COMPANY
ET. NEW YORK. N.Y.

Financial

GULF, MOBILE & OHIO.—Acquisition.—This company has asked the Interstate Commerce Commission for authority to purchase at foreclosure or other sale the property of the Mobile & Ohio, extending from East St. Louis, Ill., to Mobile, Ala., and from Artesia, Miss., to Montgomery, Ala., together with branch lines, a total of 641.7 miles of main line, 263.7 miles of branch lines and 288.6 miles of trackage rights.

NEW YORK CENTRAL.—Bonds of Big Four.—The Cleveland, Cincinnati, Chicago & St. Louis and the N. Y. C. have applied to the Interstate Commerce Commission seeking authority for the former to issue and the latter to assume liability for \$29,040,000 of Big Four refunding and improvement 4½ per cent bonds due January 1, 1964. The issue would pay off a like amount of Big Four bonds called for redemption or about to mature. N. Y. C. does not presently plan to sell or otherwise dispose of the bonds, but desires authority to assume liability in accordance with the provisions of its lease of the Big Four.

NEW YORK, NEW HAVEN & HARTFORD.—Amended Plan of Reorganization.—This road, on December 30, 1938, filed with the U. S. District Court for Connecticut and with the Interstate Commerce Commission an amendment to the plan of reorganization filed by it June 1, 1937, pursuant to permission granted by the Commission on October 11, 1938, reopening the hearings before it in the New Haven reorganization proceedings. The amended plan shows fixed charges of \$6,402,102 for the reorganized company, which is less than one-third of the \$19,531,323 of such charges for 1935, the year in which the reorganization proceedings were commenced. Under the original plan of reorganization filed by the New Haven comparable charges totaled \$9,267,909.

The amended plan proposes the following capital structure:

Equipment trust certificates	\$12,872,000.00
Underlying mortgage bonds.....	7,422,000.00
Prior lien bonds due 1954.....	7,500,000.00
Fixed interest bonds due 1975....	112,582,032.00
Income bonds due 1985.....	95,813,924.00
Preferred stock	71,656,886.00
Common stock (est.).....	77,000,000.00

The fixed charges and guarantees under would accomplish the following:

Equipment trust interest.....	\$455,012.00
Underlying bond interest.....	296,880.00
Prior lien bond interest.....	262,500.00
Fixed interest bond interest.....	4,503,281.00
Rent for leased roads (maximum)	787,829.00
Guaranties	96,600.00

Total \$6,402,102.00

Contingent interest on the income bonds will amount to \$4,311,627.

The reorganization securities proposed in the amendment vary in the following details from those proposed in the original plan:

- (1) A small issue of short term bonds, to be either a prior lien bond or a special series of fixed interest bonds, as provided for the purpose of raising cash.
- (2) The second preferred stock proposed in the original plan has been eliminated.
- (3) The new preferred stock will have ex-

clusive voting rights until its first dividend has been paid, and thereafter so long as any cumulative dividends thereon shall have accrued and remain unpaid.

Total fixed charges and guaranties under the amended plan would have been covered 1.2 times by the adjusted income available therefor in the average year of the period 1933-1938 and would be safely within the road's estimate of \$7,000,000 available for such charges for the year 1939. In the "Prospective Year" shown in the New Haven's original plan there would be available after fixed charges, contingent interest and the maximum provision of \$1,000,000 for capital expenditures, income sufficient to pay dividends of approximately 2½ per cent on the preferred stock.

The amendment does not make a definite proposal for the leased Boston & Providence but states that negotiations are in progress for rejection of the lease in the U. S. district court. It contains no provision for the permanent disposition of the Old Colony or the Providence-Warren & Bristol, although it assumes that the New Haven trustees will continue the operation of these properties pending the completion of their respective reorganization proceedings.

The amendment proposes that in distributing reorganization securities, interest on existing securities to December 31, 1939 shall be added to and treated like principal, and that new securities to be issued in exchange therefor shall be dated January 1, 1940, even if the plan becomes effective earlier than that. The computations contained in the amendment are therefore based on the amount of principal and accrued interest which it is estimated will be due on the present obligations as of December 31, 1939.

ST. LOUIS-SOUTHWESTERN.—Interest Payment.—The United States District Court at St. Louis, Mo. has authorized the trustee of the St. Louis-Southwestern to pay \$400,000 interest due November 1 on the railroad's first mortgage bond certificates totalling \$20,000,000. The order followed a hearing held last October in which a mortgage trustee and a protective committee opposed payment of the interest.

SOUTHERN PACIFIC.—Stock of the Interurban Electric.—The Interstate Commerce Commission, Division 4, has authorized the Interurban Electric, a wholly-owned subsidiary of the Southern Pacific, to issue 20,000 shares of capital stock without par value, to be sold for cash at \$10 a share, to the Southern Pacific, and the proceeds used to provide funds for working capital, including material and supplies.

WESTERN MARYLAND.—Bonds of the Washington & Franklin.—The Interstate Commerce Commission, Division 4, has authorized the Washington & Franklin to extend from January 1, 1939, to January 1, 1954, the date of maturity of \$378,000 of first mortgage bonds, to bear interest during the extended period at 4¼ per cent per year. The commission has also authorized the Western Maryland to assume liability, as lessee, for the payment of the interest, taxes, charges and assessments on the bonds as extended.

Railway Officers

EXECUTIVE

W. H. Edwards, general superintendent of the Lehigh & New England, has been elected vice-president and general manager, with headquarters as before at Bethlehem, Pa.

C. D. Becker, assistant general manager of Despatch Shops, Inc., has been elected vice-president, general manager and director of that company, with headquarters as before at East Rochester, N. Y., to succeed **L. S. West**, whose death on December 3 was noted in the *Railway Age* of December 10.

Frank H. Ford, assistant to the president of the Kansas City Southern, with headquarters at Shreveport, La., has resigned to devote more time to personal affairs. Mr. Ford was born at Queen City, Tex., on March 17, 1888, and since 1914, has served successively as vice-president and president of the W. F. Taylor Company, wholesale grocers and planters of Shreveport. Mr. Ford also served as president of the Tri-State Broadcasting Company and as a director of the Kansas City, Shreveport & Gulf Terminal, a subsidiary of the K. C. S. since 1929. He was appointed assistant to the president in January, 1934.

FINANCIAL, LEGAL AND ACCOUNTING

Lemuel W. Cox, whose appointment as secretary of the Norfolk & Western at Philadelphia, Pa., was reported in the *Railway Age* of December 24, was born on October 7, 1889, at Philadelphia. He at-



L. W. Cox

tended the public schools of Philadelphia, School of Pedagogy (1910), and the Evening School of Accounts and Finance of the University of Pennsylvania (1917). Mr. Cox entered railroad service on June 1, 1910, as clerk in the office of the secretary and assistant treasurer of the Norfolk & Western. He was appointed assist-

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Make Power Produce

MAXIMUM NET REVENUES



MONTH OF SEPTEMBER		NINE MONTHS OF YEAR	
Operating Revenues		Maintenance of Way and Structures	
Freight	Passenger (incl. misc.)		
\$151,807	\$387	\$57,458	\$21,654
14,466,658	391	1,724,600	198,126
9,348,000	200	1,724,600	175,281
9,348,000	857,890	1,724,600	1,505,748
382,879	1,468,564		

EVERY dollar saved in the roundhouse, back shop, stores department and on the annual locomotive fuel bill is another dollar that can be added to the net revenues.

Analyzed from this angle the application of HUNT-SPILLER Air Furnace GUN IRON Wear-Resisting Parts on your power offers an unusual opportunity of increasing the earnings for this coming year.

The service built into HSGI Wear-Resisting Parts insures greater mileage between renewals—fewer items on the daily work reports—lower machining costs—savings in fuel consumption and a reduction in stock inventories.

The more you use—the greater the net earnings.

HSGI

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- Cylinder Bushings
- Cylinder Packing Rings
- Pistons or Piston Bull Rings
- Valve Bushings
- Valve Packing Rings
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- Crosshead Shoes
- Hub Liners
- Shoes and Wedges
- Floating Rod Bushings

Parts Finished For Application

- Dunbar Sectional Type Packing
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- for Cylinders and Valves
- (Duplex Springs for Above)
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ant secretary on March 1, 1920, the position he held until January 1, when he was appointed secretary. Mr. Cox served as secretary and treasurer of the Railway Treasury Officers Association from 1916 to 1933.

Daniel P. Loomis, assistant to general counsel of the Delaware & Hudson, has been appointed assistant general counsel, with headquarters at New York.

H. D. York, freight claim agent of the Kansas City Southern, with headquarters at Kansas City, Mo., has resigned and the position of freight claim agent has been abolished. Loss and damage freight claims have been assigned to the jurisdiction of **G. H. Bacon**, assistant comptroller, at Kansas City.

OPERATING

John M. Henry, assistant to the general manager of the Western region of the Pennsylvania, retired on January 1. No successor has yet been appointed.

J. N. Todd, assistant engineer on the Southern, with headquarters at Washington, D. C., has been appointed superintendent of scales, with the same headquarters, succeeding **C. H. Mann**, who retired on January 1, on account of disability.

W. E. Robinson, superintendent on the Canadian National at Halifax, N. S., has been appointed general superintendent transportation of the Atlantic region. **C. S. Pushie**, assistant superintendent at Bridgewater, N. S., has been appointed superintendent of the Halifax division.

M. M. Cronk, trainmaster on the Pere Marquette, with headquarters at Benton Harbor, Mich., has been promoted to assistant superintendent of the Chicago-Petoskey division, a newly-created position, with headquarters at Grand Rapids, Mich., and **William J. Grady**, general yardmaster at Grand Rapids, has been advanced to trainmaster, with headquarters at Benton Harbor, succeeding Mr. Cronk.

G. W. Raney, whose promotion to general superintendent of the Third operating



G. W. Raney

district of the Chicago, Rock Island & Pacific, with headquarters at El Reno,

Okla., was announced in the *Railway Age* of December 3, was born at Forrest City, Ark., on January 28, 1891, and attended the University of the South, Sewanee, Tenn. He entered railway service in July, 1910, as a brakeman on the Missouri Pacific, later becoming a switchman and a yardmaster. In 1917, he went with the Ogden Union Railway & Depot Company, Ogden, Utah, as a switchman and yardmaster and three years later he returned to the Missouri Pacific as a yardmaster at Kansas City, Mo., later becoming night general yardmaster. In November, 1926, he was promoted to trainmaster and served subsequently on the Omaha, Illinois and Central Kansas—Colorado divisions. Mr. Raney left the Missouri Pacific to go with the Rock Island in March, 1936, as an inspector of transportation, with headquarters at Kansas City, Mo., and in November of that year, he was promoted to superintendent, with headquarters at Ft. Worth, Tex. In February, 1937, he was transferred to the Missouri-Kansas division with headquarters at Kansas City, the position he held at the time of his recent promotion.

J. A. Clancey, general superintendent of transportation of the Grand Trunk



J. A. Clancey

Western, with headquarters at Detroit, Mich., has been promoted to general superintendent with the same headquarters, and the position of general superintendent of transportation has been abolished.

Mr. Clancey was born at Walkerton, Ont., on June 8, 1884, and entered railway service with the Canadian National on June 2, 1901, as a messenger in the transportation department at Toronto, Ont., and later served in various clerical positions at that point. In September, 1902, he was sent to Durand, Mich., on the Grand Trunk Western (part of the Canadian National), as a stenographer in the bridge and building department. In the following year he was transferred to the transportation department, where he held various positions until July, 1910, when he was appointed cashier and supervisor of the Michigan Car Demurrage bureau. In January, 1911, he returned to the transportation department of the Grand Trunk Western, serving successively as car distributor, traveling car service agent, assistant superintendent of ter-

minals at Detroit, chief clerk to the general superintendent at Chicago, division agent Western lines at Chicago, trainmaster at various points, and superintendent of transportation. On October 1, 1928, he was further promoted to superintendent of transportation, with headquarters at Detroit, and on October 1, 1932, he was appointed superintendent of the Detroit division. Mr. Clancey was advanced to general superintendent of transportation with headquarters at Detroit, on June 1, 1936.

TRAFFIC

H. E. Watts, assistant to the chief traffic officer of the Wabash, with headquarters at St. Louis, Mo., retired on January 1.

Clark J. Ely, chief clerk in the general passenger department of the Colorado & Southern, has been promoted to assistant general passenger agent, with headquarters at Denver, Colo., a newly-created position.

W. E. Bolton, industrial commissioner of the Chicago, Rock Island & Pacific, with headquarters at Chicago, has been appointed industrial and agricultural commissioner, with the same headquarters.

Earle G. Reed, supervisor of agricultural development of the Union Pacific, with headquarters at Omaha, Neb., has been appointed supervisor of agricultural and industrial development, with the same headquarters.

James E. McCulloch, traveling freight agent on the Chicago, Rock Island & Pacific, with headquarters at Des Moines, Iowa, has been promoted to general agent at Indianapolis, Ind., succeeding **T. L. Manning**, deceased.

C. J. Stegeman, traveling freight and passenger agent on the Union Pacific, with headquarters at Cleveland, Ohio, has been promoted to general agent at that point succeeding **W. H. Benham**, who retired on January 1.

E. E. Eckert, assistant to the chief traffic officer of the Akron, Canton & Youngstown, with headquarters at Akron, Ohio, has been appointed industrial agent, with the same headquarters, and the position of assistant to the chief traffic officer has been abolished.

J. F. Anderson, chief clerk to the general freight agent on the Chicago, Rock Island & Pacific at Chicago, has been promoted to assistant general freight agent in charge of the freight tariff bureau, with headquarters at Chicago, succeeding **L. G. Tuttle**, who retired on December 31.

Wilson G. Curtiss, general agent, freight department, on the Western Pacific at San Francisco, Cal., has been promoted to assistant freight traffic manager in charge of solicitation, with the same headquarters, succeeding **Frank H. Hocken**, who retired on January 1, and **John H. Coupin**, general agent, freight department, at Oakland, Cal., has been transferred to San Francisco to replace Mr. Curtiss. **Carl W. Mangum**, general agent at

San Jose, Cal., has been appointed general agent, freight department, at Oakland, relieving Mr. Coupin and **Martin C. Kidd**, traveling freight and passenger agent, with headquarters at Pocatello, Idaho, has been advanced to general agent at San Jose succeeding Mr. Mangum.

G. F. Hardy, general agent on the Great Northern, with headquarters at Spokane, Wash., has been promoted, effective January 1, to general freight agent, with headquarters at San Francisco, Cal., succeeding **W. E. Hunt**, who will retire because of ill health on that date, and **E. C. Warren**, general agent at Fargo, N. D., has been transferred to Spokane replacing Mr. Hardy.

A. R. Anderson, perishable freight agent on the Denver & Rio Grande Western, at Los Angeles, Cal., has been promoted to general agent at that point, a newly created position. **John D. Stack**, assistant traffic manager at that point has retired and this position has been abolished. Mr. Stack was formerly general superintendent of the Denver & Rio Grande Western, with headquarters at Salt Lake City, Utah, and in October, 1926, when that position was abolished, was appointed assistant traffic manager at Salt Lake City, later being transferred to Los Angeles.

Patrick Joseph Tierney, whose appointment as assistant freight traffic manager of the Chesapeake & Ohio at Richmond, Va., was reported in the *Railway Age* of December 10, entered railroad service at Cincinnati, Ohio, in 1901 with the Queen & Crescent Route (now part of the Southern). On May 15, 1905, he became overcharge claim investigator in the

agent, in which capacity he served until his recent promotion.

Thomas Jefferson, Jr., whose appointment as general freight agent of the Chesapeake & Ohio at Richmond, Va., was reported in the *Railway Age* of December 10, was born in 1898 in Amelia county,



Moffett

Thomas Jefferson, Jr.

Va. He entered railroad service on September 13, 1915, with the Chesapeake & Ohio as clerk in the office of the auditor of overcharge claims, at Richmond. Mr. Jefferson served as percentage and division clerk in the freight traffic department at Richmond from August 16, 1924, to February 6, 1927, and was appointed assistant commerce agent at Richmond on the latter date. On October 1, 1934, he became commerce agent and on September 1, 1936, was appointed assistant general freight agent at Chicago, Ill., the position he held until his recent appointment.

Robert Joseph Beatty, whose appointment as general freight agent (commerce) of the Chesapeake & Ohio at Richmond, Va., was noted in the *Railway Age* of December 10, was born on July 20, 1899, at Indianapolis, Ind. He attended the University of Richmond and T. C. Williams Law School, Richmond, and entered railroad service on July 17, 1922, with the Chesapeake & Ohio as clerk in the freight traffic department. Mr. Beatty was appointed percentage and division clerk in the freight traffic department on October 12, 1925, and on December 1, 1926, became assistant commerce agent. He was appointed commerce agent on September 1, 1936, the position he held until his recent appointment as general freight agent (commerce). During his entire service with the Chesapeake & Ohio Mr. Beatty's headquarters have been at Richmond.

Robert Pretlow Laird has been appointed general freight agent (divisions) of the Chesapeake & Ohio at Richmond, Va., as noted in the *Railway Age* of December 10. Mr. Laird was born on May 2, 1901, at Suffolk, Va., and entered railroad service on January 21, 1918, as clerk in the accounting department of the Chesapeake & Ohio. He became percentage and division clerk in the freight traffic department on August 7, 1924, and chief clerk to assistant general freight agent on No-

vember 7, 1932. On August 1, 1937, he was appointed chief of divisions bureau, freight traffic department, the position he held until his recent appointment.

Clarence Hilton Noble has been appointed general coal freight agent (rates) of the Chesapeake & Ohio at Richmond, Va., as noted in the *Railway Age* of December 10. Mr. Noble was born in 1893 at Richmond and entered railroad service on January 7, 1907, as clerk in the freight traffic department of the Chesapeake & Ohio. He became tariff compiler in that department on April 1, 1920, and executive rate clerk on July 1, 1923. On July 1, 1927, Mr. Noble was appointed chief executive rate clerk (coal) and on October 1, 1932, coal freight agent (rates), the position he held until his recent appointment. Mr. Noble's headquarters have been at Richmond during his entire service with the Chesapeake & Ohio.

ENGINEERING AND SIGNALING

F. W. Alexander, whose promotion to assistant chief engineer of the Canadian Pacific, with headquarters at Winnipeg, Man., was announced in the *Railway Age* of December 31, was born at Fredricktown Junction, N. B., on November 22, 1878, and entered railway service in June, 1897, in the chief engineer's office of the Bangor & Aroostook, later serving in various capacities in the engineering department of that road, including resident engineer on construction. In 1903, he was employed on location work for the Restigouche & Western (now part of the Canadian National system), and later in the year entered the service of the Canadian



F. W. Alexander

Pacific as a transitman at Moose Jaw, Sask. Since then he has been division engineer at Calgary, Alta., and Cranbrook, B. C., and district engineer at Calgary and Vancouver, B. C. Mr. Alexander was promoted to engineer of maintenance of way of the Western lines, with headquarters at Winnipeg, in August, 1927.

Arthur Montzheimer, whose retirement as chief engineer of the Elgin, Joliet & Eastern, with headquarters at Joliet, Ill., was announced in the *Railway Age* of December 24, was born at Sharpsburg, Pa.,



Kay-Hart

P. J. Tierney

Kanawha Dispatch office of the Chesapeake & Ohio and on August 15, 1908, was appointed rate clerk of the Kanawha Dispatch, becoming chief rate clerk on September 1, 1913. When the Dispatch Lines were abolished by the Director General of Railroads during Federal control, Mr. Tierney was transferred to the tariff bureau at Richmond as rate and tariff clerk. He was appointed assistant to general freight agent on September 1, 1921, and on October 1, 1925, was appointed assistant general freight agent. On April 1, 1934, Mr. Tierney was appointed general freight

on January 23, 1869, and attended the Dixon College of Civil Engineering at Dixon, Ill. In 1886, he entered railway service as a roadmaster's clerk on the Chicago & North Western at Eagle Grove, Iowa, and after attending college during the following two years, returned in 1888, to a similar position on the North West-



Arthur Montzheimer

ern at Sterling, Ill. In 1889, he was appointed a rodman in the engineering department and he was later promoted to instrumentman. In 1891, he was promoted to assistant engineer and served in that capacity at various points in Illinois and Wisconsin. Mr. Montzheimer was promoted to superintendent of bridges and buildings, with headquarters at Milwaukee, Wis., in 1895, and in 1903, he left the North Western to become chief engineer of the Elgin, Joliet & Eastern and the Chicago, Lake Shore & Eastern (now a part of the E. J. & E.) with headquarters at Joliet. During the period of federal control of the railroads, he also served as chief engineer of the Chicago, Milwaukee & Gary. Mr. Montzheimer has long been active in various railroad and engineering associations including: the American Railway Bridge and Building Association of which he was president in 1904, the American Railway Engineering Association of which he was a director from 1927 to 1930, and a chairman for three years of the Yards and Terminals Committee, and the American Wood Preservers Association.

OBITUARY

William E. Wherity, lumber traffic agent of the Illinois Central, with headquarters at Chicago, died on December 17.

John L. Nisbet, from 1925 to 1927 president of the Georgia, Florida & Alabama (now part of the Seaboard Air Line), died at Atlanta, Ga., on December 21. Mr. Nisbet had been in poor health.

Bruno W. Rose, who was promoted to land and tax commissioner of the Illinois Central, with headquarters at Chicago, in August, 1938, died suddenly at the Illinois Central hospital, Chicago, on December 17, of a cerebral hemorrhage. A bio-

graphical history of the railroad career of Mr. Rose and his picture were published in the *Railway Age* of September 3, 1938.

Col. Franklin G. Robbins, who retired in 1927 as vice-president of the Chicago region of the Erie, died at his home at Highland Park, Ill., on January 1. Mr. Robbins was born at La Crosse, Wis., on February 14, 1876, and entered railroad service in 1888, serving during school vacations as a messenger and later as a rodman and an operator for the Minneapolis, St. Paul & Sault Ste. Marie. In 1896, he entered the employ of Kenneth Hopkins & Company on the Chicago Board of Trade and in 1906 entered the service of the Chicago, Burlington & Quincy as special car agent. He then served consecutively as traveling yardmaster, assistant trainmaster, trainmaster, assistant superintendent and superintendent. In 1913, he became superintendent of the Elmira, Corning & Waverly (an Erie subsidiary), and in 1916 he was appointed general superintendent of the Erie at Chicago. In 1917, he entered the United States Army as a major and was later promoted to lieutenant-colonel. In 1920 he was appointed director of the Bureau of Service of the Interstate Commerce Commission, and two years later he resigned to accept the vice-presidency of the Chicago & Erie, later becoming vice-president of the Chicago region of the Erie.

William W. Wood, superintendent of the safety and welfare departments of the Baltimore & Ohio, died on December 23, as reported in the *Railway Age* of Decem-



William W. Wood

ber 31. Mr. Wood was born in Missouri, on August 13, 1861, and attended Missouri Central College and Johns Hopkins University. He began his career with the Baltimore & Ohio in 1890, becoming industrial agent in 1899, and later general industrial agent. In 1916 he was appointed special representative of the president and afterwards became agricultural director. In 1920 he became chief of the welfare department. Mr. Wood was promoted to the superintendency of the safety and welfare departments in February, 1927, in which capacity he was under the jurisdiction of the vice-president in charge of operation and maintenance.

I. C. C. Annual Report

(Continued from page 99)

operation, but nevertheless of much importance from the standpoint, not of immediate, but of ultimate results." There follows the above-mentioned endorsement of the Splawn-Eastman-Mahaffie committee recommendations with reference to liberal government loans to railroads. Also, reorganizations "must be pressed to completion as rapidly as possible," in which connection "every reasonable effort should be made to protect existing security-holders, but not where their securities have clearly lost all value."

LOWER COSTS WOULD CREATE NEW BUSINESS

Summarizing on "consolidation, co-ordination and competition," the report asserts that "they make a serious mistake who regard the elimination of wastes which are now inherent in the present railroad set-up and in the relations of all the agencies of transportation as a mere means of cheese-paring economy and depriving more men of work." It adds that "transportation success can never be the product of high rates and restricted service;" consolidation, co-ordination, and the better adjustment of competitive conditions "will reduce transportation costs, but they can also open the door to the better service and lower prices which will create new business and employment." Next, as noted above, the commission rejects the compulsory single-system and the free-hand-for-the-railroads-in-consolidations ideas, adding that the recommendations of the Splawn-Eastman-Mahaffie committee with respect to this matter "were along generally sound lines." Briefly, that committee proposed to eliminate the consolidation plan and to permit the commission to approve whatever unifications it found to be in the public interest. Meanwhile the study of consolidations and co-ordinations would be among the duties of a proposed three-man transportation authority, which would have power to intervene in such proceedings before the commission. Also, it was proposed to give the commission power to require "co-ordinations," but no provision for compulsory consolidations was recommended, pending study of the matter by the transportation authority.

SEES NEED FOR NEW AGENCY

The commission sees the need for some such agency as the proposed authority to carry on in the transportation field "promotional activities" which "are clearly not of a class of functions which have been laid upon the commission by congress." In other words, the report adds, "there is a field here both for continuing study and research and for active, aggressive, and consistent leadership on the part of government which has never been occupied—the real problem is to fill that void in the best possible way." Finally, the commission does not undertake to specify how the continuing campaign which it thinks the transport situation calls for "shall be organized and directed;" it believes that

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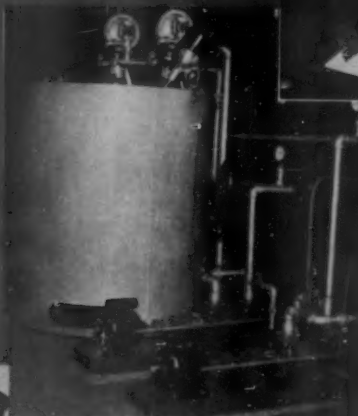


SURVEYS

A full report with recommendations is available without charge.

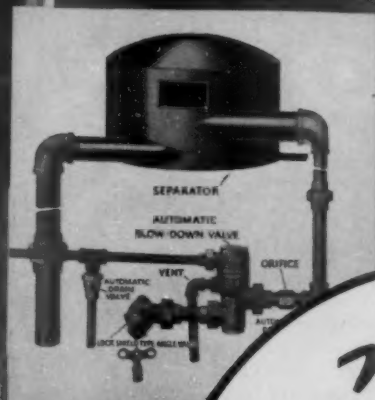
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Chemical pumps and belt feeders for feeding water treating chemicals... complete line... designed by Nalco.



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Automatically keeps the concentration of dissolved solids in boiler water below



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NALCO SYSTEM

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"such matters can more appropriately be dealt with at other times and on other occasions, as the congress may see fit to request our advice and assistance."

STATUS OF THE COMMISSION

The two-page discussion of its own status the commission thought appropriate "in view of the rather widespread discussion of the general subject." Its above-mentioned denial that it is an "irresponsible" body is bolstered by the assertion that it is "in fact responsible to three authorities." They are: Congress, to which it reports; the courts, which can set aside its actions; and the President, in that he selects its membership with the advice and consent of the Senate . . . "and can at will supplant members when their terms expire." The great bulk of its duties, the commission goes on, are "quasi-legislative," while a few are "quasi-judicial" and another few "quasi-executive." The admixture of these latter two, however, "comes about from the fact that they are intimately related to the legislative duties, and require the same special knowledge, experience and time for investigation." (In this connection President Roosevelt's message transmitting the Splawn-Eastman-Mahaffie committee's report to congress last April expressed the view that the I. C. C.'s "purely executive" powers "are, in all probability, unconstitutional.")

The commission thinks that "confusion of thought" has arisen because it employs a procedure which resembles that employed by the courts and because it performs "certain duties which may be classed as administrative from the standpoint of its own work, but which are nevertheless integrally part and parcel of its quasi-legislative duties." Finally, it is "able to say without hesitation" that in federal and state regulation of railroads and utilities "the thing of supreme importance is to keep it most scrupulously out of politics." It adds that "domination or influence of the regulatory body by either the executive or the legislative branch of the government is certain to bring it within the political sphere with results unfortunate if not disastrous."

Next the report reviews the traffic and earnings of transport agencies, finding that in 1937 the operating expenses, depreciation and taxes of all carriers aggregated \$22,245,000,000, with railroad operations accounting for "but 19.77 per cent in contrast with 75.04 per cent for all highway operators" including 51.59 per cent for private automobiles and 17.22 per cent for private trucks. The review of class rate readjustments during the year notes that the Southern governors' rate complaint, which had been held in abeyance "awaiting the readiness of interested parties to proceed," has now been discontinued "without prejudice to future consideration." After brief reference to drought relief rates and co-operation with state commissions, the report proceeds to a highlight review of findings coming out of the freight forwarding investigation. In this connection, it says, the railroads have as yet had insufficient time to determine their policy with respect to the commission's suggestion that they offer forwarding services themselves "by appropriate cooperative

effort . . . through one or more wholly owned and controlled agencies, such as the Railway Express Agency." Note is taken of the discontinuance of free l. c. l. pick-up and delivery service by the New York Central and certain other Eastern lines; but the commission nevertheless observes that c. & d. "now seems to have become an established practice."

MANY NEW PRACTITIONERS

A paragraph on the Railroad Credit Corporation reveals that that agency had by October 31 returned to participating carriers \$56,971,440.11 or 77.5 per cent of the original emergency revenue. It takes four pages to list reports published during the year in investigations instituted on the commission's own motion, and considerable attention is also given to admissions to practice. During the year ended October 15, 1938, 1,378 applicants were admitted—a new high. The passing upon applications "has become somewhat of a burden," thus the recommendation for legislation permitting the imposition of a fee which "would compensate for the time and expense involved, and would suffice to deter those who have no intention of making use of the privilege."

Before getting into its review of the work of various I. C. C. bureaus, the report covers in turn the commission's compliance with the Federal Register Act, its standard time zone investigation, the 15 per cent cases of 1937 and 1938 and the Pullman rate-increase case.

Senator Wheeler's investigation of railway finances has continued to engage the services of the commission's accountants; since its beginning in July, 1935, employees of the Bureau of Accounts have been engaged thereon "a total of 44,543 man-days." Because of this and other present conditions the Bureau has been unable to make field investigations as frequently as they should be made, and indeed made no such investigations during the year of the accounts of carriers other than railroads. Meanwhile, "continued progress has been made in connection with the revision of the accounting regulations for steam railways and sleeping-car companies."

BUREAU OF FINANCE

The section on the Bureau of Air Mail appears for the last time, this matter having passed from the commission's jurisdiction. The section on the Bureau of Finance reviews the year's work of that Bureau in connection with such matters as certificates of public convenience and necessity, acquisition of control of one carrier by another, issuance of securities, and Reconstruction Finance Corporation loans. Actual issue of \$220,682,272 was authorized during the period under review, a large part of which represented refinancing. During the period covered by the report "the amount of temporary financing is more than three and one-half times greater than in the previous period, and about 49 per cent thereof (\$16,656,000) was for the purpose of renewing or refunding existing obligations." The additional capitalization resulting from the various authorizations "amounts to \$78,788,067 and 2,552 shares of common stock

without par value, of which \$34,056,500 represented equipment-trust certificates issued to obtain new money for the purchase of equipment." Since its previous report the commission approved R. F. C. loans aggregating \$46,103,500 upon applications filed by 12 carriers. Also, since that time there have been five additional section 77 proceedings involving seven railroad companies.

The commission conducted 590 hearings during the period covered by the report on matters passing through the Bureau of Formal Cases; this was a drop from the 679 hearings of the previous year but the number of pages of testimony taken was up to 129,359 from the previous year's 110,503. The Bureau of Inquiry conducted more than 200 investigations while the Bureau of Law concluded 45 cases. Activities of the Bureau of Locomotive Inspection and the Bureau of Safety, highlighted in the report, will be covered in reviews of their separate reports in forthcoming issues of *Railway Age*. Likewise, the commission's 18-page review of the work of the Bureau of Motor Carriers will be covered in a subsequent issue.

The report's section dealing with the Bureau of Service notes the indefinite suspension by the Association of American Railroads of the average per diem plan, but it pays tribute to the carriers and the A. A. R. "for the efficient handling of the 1938-39 wheat crop, which was the largest, except for one, in the past 15 years, yet was moved without complaint." During the year the number of fusion-welded tank cars approved for test purposes increased to a total of 527.

The review of the work of the Bureau of Statistics refers to the A. A. R. proposal for simplification of the commission's statistical requirements, the most important changes suggested being "the omission of the separation of freight and passenger expenses, the elimination of certain annual report schedules, and the consolidation of the various reports of operating statistics into a single and less complete monthly report." As the separation of expenses "is part of any system of cost finding," a decision on that proposal has been deferred pending the outcome of the Ex Parte 122 investigation of "Cost Finding in Transportation Service." The other changes proposed "are under consideration."

A total of 413 fourth-section applications passed through the Bureau of Traffic during the period under review; meanwhile there were entered in fourth-section cases 452 orders of which 39 were denial orders. Taking all rate-readjustment proposals there were 442 protests and requests for suspensions, an increase of 14 over the previous year. The Bureau of Valuation continued the work of bringing inventories up to date and also supplied exhibits for several cases including the Ex Parte 123 rate proceeding and the Pullman rate-increase case. This Bureau's appropriation was again cut "and it was necessary to reduce personnel to a point below what is considered sufficient to carry on the work." During the second and third sessions of the seventy-fifth congress the commission's legislative committee submitted 19 reports on bills or resolutions.

